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British Society for the History of Pharmacy
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British Society for the History of Pharmacy

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The British Society for the History of Pharmacy was formed in 1967 under the aegis of the Pharmaceutical Society of Great Britain, having originated from its History of Pharmacy Committee.
BSHP seeks to act as a focus for the development of all areas of the history of Pharmacy, from the works of the ancient apothecary to today's ever changing role of the community, hospital, wholesale or industrial pharmacist.

Aims

Promotion of historical studies related to pharmacy.
Advancement of knowledge and propagation of understanding of the history of pharmacy.
Publication of the research work of pharmaceutical historians.
Preservation of pharmaceutical artefacts and historic pharmacies.
Support for the work of relevant museums and offering advice on establishment of other pharma-ceutical exhibits and on the preservation of pharmacies.
Co-operation with related professions and local historians on medico-pharmaceutical topics of mutual interest.

Pharmaceutical Historian

The *Pharmaceutical Historian* has been published since 1967, at first intermittently, but on a regular quarterly basis from 1972. Issues generally comprise 16 or 20 pages and cover.
An index for the years 1967-1995 was published in 1998, for 1996-2000 2000, for 2001-2005 in December 2005 and for 2006-2010 in December 2010. They can be viewed on the website.
Papers, short communications and letters in English on any aspect of the history of pharmacy are welcome and should be sent to the address above or by email to *ainley.wade @easynet.co.uk*
Any illustrations are converted to monochrome for printing. Further details of requirements can be found on the website *www.bshp.org* under Publications.

Membership

Membership costs £20.00 per annum and includes:

Four issues of the *Pharmaceutical Historian*.

Regular meetings, with guest speakers, usually in November, February and May.

Visits to places of historic interest, museums, collections, botanical gardens, etc.

Annual Conference, usually in March/April.

Free use of Royal Pharmaceutical Society of Great Britain's library facilities for research.

Help in historical research and with the identification of artefacts.

Affiliation to the International Society for the History of Pharmacy (ISHP).

Affiliation to the British Society for the History of Medicine (BSHM).

Application forms are available from the Honorary Secretary at the address above or on *www.bshp.org*

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1974, 1975	Dr John K Crellin
1976, 1977	Dr Juanita Burnby
1978, 1979	Miss D Ann Hutton
1980, 1981	Mr Arthur Wright
1982, 1983	Dr William E Court
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PHARMACEUTICAL HISTORIAN

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www.bshp.org

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Diary

Because of revised charges at the RPS, Lambeth, the longstanding arrangements for meetings have been reconsidered by the Committee. The times or dates of meetings may be changed - see noticesfrom Secretary.

Wednesday 4 May 2011

'The History of Thalidomide' By Louise Medus-Mansell at Lambeth.

Monday 10 October 2011

'History of Medicines Registration' By Diane Leakey. 6.00 at Lambeth.

BSHP Spring Conference 1-3 April 2011

York Pavilion Hotel, Fulford, York.

The overall theme for the weekend will be **Pharmacy as part of Social History.** Further details from Shirley Ellis at 1 Willow Way, Bottisham, Cambridge CB25 9BS or by e-mail to: *shirleyellis@shirlellis.plus.com*

British Society For The History Of Medicine: 24th Congress, 31 August-3 September, 2011

University of Surrey, Guildford (see opposite)

In association with the Faculty of the History and Philosophy of Medicine and Pharmacy of the Society of Apothecaries Topics include: Apothecaries and Quacks; Museums and Archives; Military Medicine; Medicine and Madness; Modern Medical Advances.

Details available from: BSHMCongress@hotmail.co.uk or Mrs. Elizabeth Wood Congress Administrator, Society of Apothecaries, Black Friars Lane, EC4V 6EJ, Mobile 07748663428. Messages can be left at 020 7236 1189.

Obituary

Mr Anthony C Morson died in October 2010. He was president of BSHP in 1996 and 1997. He published several papers in the *Pharmaceutical Historian* on his 19th C ancestor Thomas NR Morson.

Nicholas Culpeper: London's first GP? The evening lecture given on Wednesday 2nd February by Prof. Michael Starling, now Vice-Chancellor of Sussex University, was recorded and may be heard on: https://rpsgbmc.webex.com/rpsgbmc/ldr.php?AT=pb&SP=MC&rID=10537787&rKey=E3887075C4E980D5

40th International Congress for the History of Pharmacy

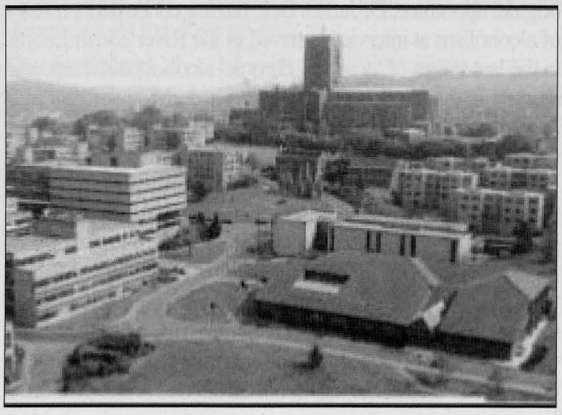
Berlin, 14–17 September 2011

The 40th International Congress will be held at the Berlin-Brandenburg Academy of Sciences and Humanities, Markgrafenstraße 38, 10117 Berlin.

The theme of the Congress is **Pharmacy and Books** – aspects will include books as sources of pharmacy history, pharmacists as authors and as subjects of fiction. Papers can be submitted as abstracts up to 31 May 2011.

Full details of the congress programme and the excursions for accompanying persons, with a booking form, can be found at www.40ichp.org/

Printed copies of the advance programme are available from Peter Homan (see back cover). It is expected that several members of BSHP will attend and present papers.



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The Seaman's Medicine Chest in the late 18th Century

Dr S W Stuart Menzies
North Shields

Introduction

The last half of the 18th C saw few medical publications written specifically for masters of merchant vessels not carrying a surgeon or apothecary, ie written for non-medical readers or lay persons.[1] Some merchant vessels (especially whaling ships) carried a medicine chest but few carried a surgeon as well. Gordon,[2] in her survey of the subject, notes the following works for the layman: N D Falk, *The Seaman's Medical Instructor* and W Northcote, *The Shipmasters Medical Assistant.* This latter appears to be a much simplified version of his earlier book for ship's surgeon's mates entitled *The Marine Practice of Physic & Surgery*.[3]

In July 1790 a law was promulgated in the US requiring every vessel of 150 tonnes or over, belonging to a citizen of the US and carrying a crew of 10 or more men, to carry a chest of medicines. This collection of medicines was to be put together by a reputable apothecary and accompanied by written instructions on how to use the contents. Such information was frequently pasted inside the lid of the medicine chest, or produced as a pamphlet to accompany the medicine chest.

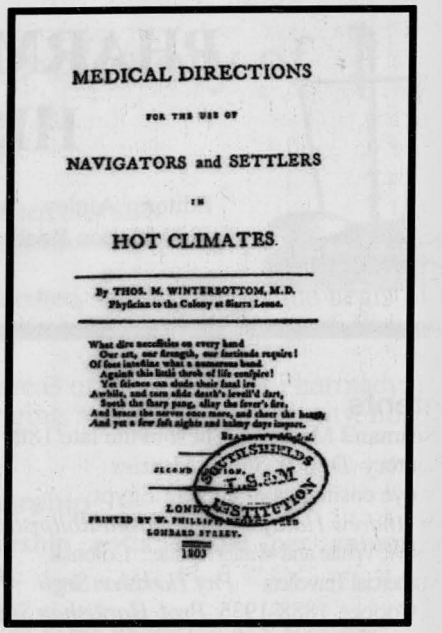
Later in March 1805 the requirements were modified, and the size of vessels covered was reduced to 75 tonnes, and the size of the crew reduced to six or more. It was not until 1835 however, that a British law was introduced requiring the provision of a medicine chest on merchant vessels.

To the two books already referred (Falk and Northcote) we now consider: TM Winterbottom's *Medical Directions for Navigators and Settlers in Hot Climates,* published in 1803.[4]

Thomas Masterman Winterbottom, (1766-1859) was the eldest son of James and Lydia Winterbottom; James was a surgeon practising in South Shields, County Durham. Thomas studied in his father's practice, and spent two years at Edinburgh University. In 1792 he submitted his thesis on Puerperal Fever to the examination board of Glasgow University, and was granted the degree of MD.

After six weeks at the Public Dispensary in Carey Street, London, with Dr Robert Willan, Winterbottom was appointed Physician to the Sierra Leone Company.[5] The original appointee, Dr James Bell, having concealed a history of alcoholism at interview, arrived in the River Sierra Leone, in the last stages of 'acute on chronic' alcohol poisoning, and died on 13th March 1792, without ever leaving the ship.[6] Dr Winterbottom, Bell's substitute, arrived in Freetown on the 17th July 1792.

Although not the only medical gentleman, and certainly not the most senior in experience, Thomas Winterbottom was given the responsibility of 'Senior Physician' and acted as Medical Officer in Freetown, Sierra Leone from 1792 to 1796. He was asked by the Directors of the Sierra Leone Company to prepare notes … 'for the use of such trading vessels in the service of the Sierra Leone Company as were unprovided with surgeons.' This he did and some time later,


MEDICAL DIRECTIONS

FOR THE USE OF

NAVIGATORS and SETTLERS

IN

HOT CLIMATES.

By THOS. M. WINTERBOTTOM, M.D.
Physician to the Colony at Sierra Leone.

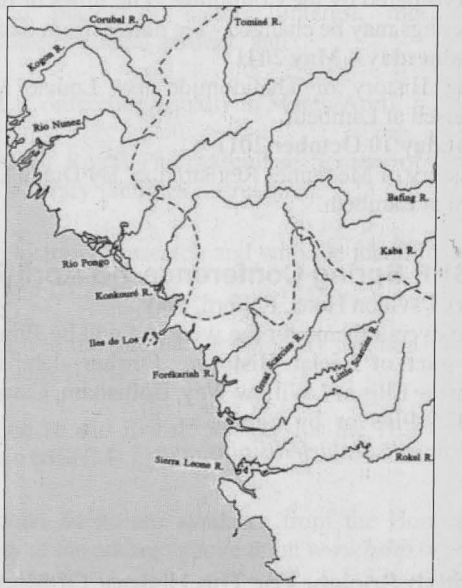
What dire necessities on every hand
Our arts, our strength, our fortitude require!
Of foes intestine what a numerous band
Against this frail throb of life conspire!
Yet fulness can elude their fatal ire
Awhile, and turn aside death's levell'd dart,
Smith the fiery purge, allay the fever's fire,
And brace the nerves once more, and cheer the heart
And yet a few felt nights and balmy days impart.

SECOND Edition.

LONDON:
PRINTED BY W. PHILLIPS,
LOMBARD STREET.

1803

after expansion to include settlers in any similar tropical lands, he had those notes printed and published as *Medical Directions for Navigators and Settlers in Hot Climates,* London, 1803.



Sierra Leone coast of West Africa

The trading vessels belonging to the Sierra Leone Company, of which there were seven or eight, were largely engaged in local coastal and estuarial trading as far north as the Rio Nunez, and south into the Bight of Benin, although occasional voyages to and from England were also made. The vessels *Amy, Anna, Eliza, Harpy, Ocean, Naimbanna,* and *York* are mentioned as the being the Sierra Leone Company's vessels.[7] The *York* after bringing a number of settlers out from England was used thereafter as a store ship, until she took fire and was totally destroyed. The crews of the other vessels were at high risk of ague (malaria) as the ships sailed up rivers

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bordered by mangroves and swamps. Other high risks included alcoholism, venereal diseases and of course injury.

As there were no divisions into chapters, no table of contents and no index in the book, it must have been a nightmare to use in times of emergency. (Perhaps Winterbottom's original notes were more practically arranged.)

The book itself, *Medical Directions for Navigators and Settlers in Hot Climates,* deals with:

Diet. Winterbottom advised fresh fruit and vegetables, and little or no spirits. He firmly believed in moderation at all times.

Dress. should be loose, of cotton or flannel.

Deportment or behaviour. Inebriation caused many problems, and sleeping off excess alcohol, especially in the cool night air without much clothing, was sure to result in ague (malaria) or some other fever.

Diseases affecting seamen (and settlers); common problems and their management.

Drugs ie The Medical Chest with which this paper is most concerned.

The significance of mosquitoes as vectors of malaria (and other diseases) was unknown at that time; it is important therefore to recognise the perspicuity of Winterbottom's advice to 'cover up at night', thereby unwittingly providing the smallest skin surface for mosquitoes to indulge their nocturnal feeding habits.

The Medical Chest

Out of the total 144 pages in *Medical Directions for Navigators and Settlers in Hot Climates,* just over 12 are devoted to the section on the medical chest. In describing the Medicine Chest Winterbottom deals with his subject under the following headings:

- The Weights used in Medicine.
- List of medicines, with the quantity sufficient for twenty men for one year; after listing 25 internal medicines, he adds 12 external preparations.
- List of Stores for the sick.
- There follow brief notes (with dosages where appropriate) on the use and storage of each of the medications, both internal and external.
- A short description of the construction of the medicine chest.
- List of Utensils necessary for the medicine chest.

Weights and Measures

Winterbottom notes that both goldsmiths and apothecaries use the troy pound which contains twelve ounces, but divide the ounce differently. He describes the differences in some detail remembering that he is writing for lay people with little schooling.

Goldsmiths divide their ounce into twenty penny-weights, and each pennyweight into twenty-four grains: thus there are 20 x 24 grains (ie 480 grains) in each ounce. Apothecaries however, divide their ounce into eight drachms, each drachm is divided into three scruples, and the scruple into twenty grains. Once again there are 480 grains in an ounce.

Dry measure is as follows: Half ounce measure of any fluid is equal to the contents of a common table-spoon.

Apothecary's dry measure is:

pound (troy)	i	contains xij	ounces	1 lb Troy =	373.24g
ounce Troy[8]	℥i	contains viij	drachms	1 oz =	31.103g
half ounce	℥fs	contains iv	drachms		
two drachms	ʒij	contain vi	scruples		
one drachm	ʒi	contains iij	scruples	1 dr =	3.887g
half drachm	ʒfs	contains ifs	scruples		
one scruple	℈i	contains xx	grains[9]	1 scr =	1.296g
half scruple	℈fs	contains x	grains	=	648mg
one grain	gr i			=	64.8mg

The medicines used

The widespread 18th-century concept of disease may be summed up somewhat crudely as disease is an imbalance of humours. Logically, treatment was aimed at restoring the proper balance. This was usually achieved by regimen (diet), evacuations, purging, vomiting and bleeding, and drugs.[10] Winterbottom had a sound approach to regimen for healthy living, preferring fresh air, fresh fruit and a minimum of spirituous liquor. He rarely advocated bleeding, but certainly used medications.

Typically, preparations of the late 18th to early 19th century were classed *inter alia* as:

Cathartics: angostura bark; calomel; rhubarb; castor oil, spirit of nitre

Emetics: ipecac; gentian; tartar emetic; antimonial wine; calomel

Diaphoretics: ipecac; tartar emetic; antimonial wine; calomel

Tonics: angostura; columbo; gentian

Sedatives: opium; laudanum

Analgesics: opium; laudanum

Many preparations on Winterbottom's list fall into more than one category, and often the properties depended on the dose given.

Quantities

His recommendations for the contents of the seaman's medicine chest included the suggested quantities sufficient for twenty men for one year. (They are assumed to be Avoirdupois.)

A. *Peruvian Bark*	10 lb	4.536 kg
B. *Angustura Bark*	4 lb	1.814 kg
C. *Powder of Colombo*	1 lb	0.454 kg
D. *Rhubarb*	10 oz	283.5 g
E. *Ipecacuanha*	1 lb	0.454 kg
F. *Tartar emetic*	2 oz	56.7 g
G. *Antimonial wine*	8 oz	226.8 g

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H. *Opium*	½ lb	226.8 g
I. *Laudanum;*	1 lb	0.454 kg
(*Thebacic tincture, Tinct. of Opium.*)		
K. *Calomel.*	12 oz	340.2 g
L. *Sweet Spirit of Nitre*	1 lb	0.454 kg
M. *Oil of Mint*	3 oz	85.05 kg
N. *Huxham's Tincture of Bark*	12 oz	340.2 g
O. *Spirit of Lavender*	1 lb	0.454 kg
P. *Cathartic,* or *Epsom Salts*	10 lb	4.536 kg
Q. *Camphor*	12 oz	340.2 g
R. *Gentian Root*	6 lb	2.722 kg
S. *Cream of Tartar*	4 lb	1.814kg
T. *Castor Oil*	6 lb	2.722 kg
U. *Gum Arabic*	3 lb	1.361 kg
V. *Bilious or Purging Pills*	no quantity given	
W. *Magnesia.*	2 lb	0.907 kg
X. *Salt of Tartar*	1 lb	0.454 kg
Y. *Diluted Vitriolic Acid*	1 lb	0.454 kg
Z. *Dilute Nitrous Acid*	½ lb	0.227 kg
No.1. *Cerate.*	3 lb	1.361 kg
No.2. *Simple Ointments*	3 lb	1.361 kg
No.3. *Red Precipitate*	6 oz	170.1 g
No.4. *Blue Vitriol*	2 oz	56.70 g
No.5. *Blister Plaster*	3 lb	1.361 kg
No.6. *Powdered Spanish flies*	4 oz	113.4 g
No.7. *Extract of Lead*	2 lb	0.907 kg
No.8. *Sugar of Lead*	1 lb	0.454 kg
No.9. *Spirit of Hartshorn*	2 lb	0.907 kg
No.10. *Flowers of Sulphur*	10 lb	4.536 kg
No.11. *Sticking plaster spread on cloth*	no quantities given	
No.12. *Tow, lint, rags*	no quantities given	

Stores for the Sick

Barley	12 lb	5.443 kg
Sago	10 lb	4.536 kg
Tapioca	10 lb	4.536 kg
Portable Soup[11]	6 lb	2.722 kg

(ie less than the Royal Navy's recommendation which was 50 lbs (22.68 kg) for 100 men[12]

Vinegar	8 lb	3.629 kg
Concrete acid of lemon[13]	2 lb	0.907 kg

To the above articles should be added

Sugar, tea, coffee, molasses, onions. No quantities given.

His advice as to storage of the medicaments concentrates on correct identification of each and preservation, but there is no recognition of deterioration of efficacy over time. He recommends that:

the name of each medicine be pasted on side of the container;

the letter or number of each medicine on the list also be pasted on the bottom of container, so that the contents may always be identified by reference to the lists (letters referred to internal medications, whereas numbers referred to external applications);

ointments should be kept in jars with painted tin covers;

powder and liquid medicines should be in bottles with ground glass stoppers; the only way that they can be preserved in good order for any considerable length of time. He notes that corks even if covered with wax are not adequate to keep the powders dry; and that cockroaches are very apt to eat through the wax and destroy the corks.

Dosages: are given in full in the text of the medical sections of the book, however brief notes are also given in the expanded description of the recommended lists. He describes the dose given as for full grown men and suggests that a boy of 12–14 years requires half the dose.

A number of other items were also advised such as:

Utensils

Half pint marble or glass mortar

Scales of size used for weighing gold (see notes on differences between goldsmith's and apothecary's weights)

Set of weights up to one ounce troy (max.)

Spatula or knife for spreading plasters

Small funnel

Pewter measure, upper part - one ounce, lower part - half ounce

Large pewter syringe for clysters with two pipes, one curved to facilitate self administration of enema

A few small gallipots, phial, corks &c.

Construction of the Medicine Chest

Winterbottom recommends an oblong box, but unfortunately he gives no indication of the actual dimensions. He suggests that the box should have partitions running along the sides and ends, to hold the larger bottles and jars on the bottom; this will leave an empty space in the middle, where the mortar, tow, lint, utensils etc. may be put. Above the lower bottles a similar set of partitions should run along sides and ends, for smaller bottles, the space between the bottles in the upper part could be filled by a removable, partitioned box. To prevent misuse of the contents he recommends that the chest be secured by a good lock.

Appendix 1 preserves Winterbottom's comments on the use of each preparation and hints as to preparation and preservation; for example he notes that Vitriolic Acid and Nitrous Acid[14]

are best kept in phials, having ground glass stoppers; and they should be dropped out of the bottle with attention, as they injure the colour and texture of all woollen or linen cloth on which they fall.

Appendix 2 is an attempt to identify the preparations mentioned by Winterbottom, in Estes' *Dictionary of Protopharmacology, Therapeutic Practices 1700-1850.*[15]

Author's address: Dr S W Stuart Menzies, 32 King Edward Road, Tynemouth, North Shields, Tyne & Wear NE30 2RP; stuart@swsm.co.uk

Appendix 1

Recommended Contents of the Seaman's Medicine Chest

Internal preparations indicated by letters

Note: The following text is taken verbatim from Winterbottom's *Medical Directions &c.*

A. Peruvian Bark. The use of this remedy has already been sufficiently noticed. [ie in the text of the book]

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B. Angustura Bark is used in the same cases and in the same quantity as the Peruvian bark; in fluxes however, after the bowels have been sufficiently opened by purgatives, it is more useful than the other bark. It likewise contributes much to strengthen the bowels when weak or when diarrhoea has continued for some time. It may also be employed in those cases where the Peruvian bark is apt to be too purgative.

C. Powder of Colombo. This is a very excellent bitter. A dose of 15 or 20 grains taken two or three times a day in water, strengthens the stomach, and often removes sickness and vomiting in delicate constitutions. Patients recovering from fever, who are still weak and cannot bear the bark, will find themselves much benefited by the use of colombo.

D. Rhubarb is a very gentle purgative, and may be given when anything has disagreed with the stomach or bowels. Thirty grains of it taken in a little water, or warm water and a little spirit, will generally remove a looseness.

E. Ipecacuanha is one of the gentlest vomits which can be administered. When the stomach and bowels have been disordered by any indigestible food, &c. the offensive matter may be discharged by giving 20 or 25 grains of ipecacuanha, and a dose of rhubarb the following morning. In fluxes ipecacuanha is not so effectual a vomit as tartar emetic; and in fevers, when there is costiveness, a grain or two of emetic tartar should be added, to render the ipecacuanha more quick in its operation, and to move the bowels. Twenty-five or thirty grains of ipecacuanha make a sufficient dose for a strong man. A small bason full of warm water or tea may be taken as soon as sickness is excited, and may be repeated every time the patient vomits. In general three or four small basons of tea or warm water, will suffice to work off any emetic: when more is swallowed it loads the stomach, and sometimes prevents the intended effect.

F. Tartar emetic. Great caution should be observed in using this medicine, as it is a very powerful emetic, and when given in too large a dose, maybe attended with fatal effects. A single grain, or for very robust persons, in whom the action of vomiting is not easily excited, 2 grains of tartar emetic, mixed with 15 or 20 of ipecacuanha, make a safe and effectual vomit; it is quicker in its operation than ipecacuanha alone, and does not produce that continued distressing sickness which tartar emetic usually occasions when given singly. This remedy being very apt to purge briskly, ought not to be given as emetic in cases of looseness. In other disorders it may be used alone in the following manner; dissolve 3 grains of emetic tartar in a pint of water, and give 3 table spoonfuls every fifteen minutes till it excites vomiting, when it should be discontinued. In this manner it will purge more certainly than when the whole quantity is taken at once, and is therefore very useful at the beginning of fevers, or fluxes. Two or three drams of cathartic or Epsom salt added to the solution, will increase the purgative effect, if that should be thought necessary.

G. Antimonial wine is of the same nature as the last mentioned article. A table-spoonful of it will generally excite sickness and vomiting: its chief use, however, is to produce a sweat, which it commonly does in the dose of a tea-spoonful, more especially if 25 or 30 drops of laudanum be united with it.

H. Opium is the most efficacious of all known remedies in relieving pains of the human body. Two grains of it in a pill form a sufficiently large dose; and are often retained on the stomach when liquids are rejected. The repeated use of it is apt to bring on costiveness, wherefore gentle purgatives must be occasionally interposed.

I. Laudanum; Thebacic tincture, or Tincture of Opium. This is opium dissolved in a certain proportion of spirit, so that the small doses of it can be given with greater exactness than of solid opium. Thirty drops in a little of any liquid is a proper dose for a man. It does not always procure sleep, but generally keeps the person who takes it easy and quiet during the night.

K. **Calomel.** This is a mercurial preparation, used either as purge in the quantity of 6 or 8 grains, or as an alternative in smaller doses frequently repeated until it renders the mouth sore and brings on a slight spitting. Six or eight grains of it will generally produce two or three stools: if it has not the desired effect within twenty-four hours, a dose of salts, castor oil, &c. must be given to prevent the mouth from being made sore. When it is intended to produce a salivation, one grain may be taken night and morning, or two grains at once every night. As soon as a disagreeable taste of copper or brass is perceived in the mouth, or when the gums become tender, hot and rather sore, the medicine must be discontinued some time, lest the salivation be rendered too violent. If the bowels be costive, a dose of salts, will also lend the effects of the mercury less severe. When this remedy is taken, acids ought to be avoided, even the juice of lemons and oranges, as they are apt to cause griping pains in the stomach and the bowels. Calomel does not act more violently as a purgative when given in a considerable dose than in a more moderate one: neither is it more apt to gripe in a larger dose. It may also be observed that a boy of fourteen years is not more severely purged by 6 or 8 grains of calomel, than a man. The calomel may be made into pills with a little soft bread, or mixed up with molasses. A dram of calomel mixed with an ounce of pomatum, hog's lard, or of wax and oil melted together, makes an ointment to kill vermin in the head, &c.

L. Sweet Spirit of Nitre. Thirty or forty drops may be taken five or six times a day in water. It contributes much in fevers to preserve a gentle moisture upon the skin, to abate the thirst, head-ache, and restlessness; it may also be added to the patient's common drink. It frequently gives relief in the gravel, taken in the

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quantity of 60, 80, or even 100 drops at bed time, alone, or joined with 30 drops of laudanum. When a copious sweat is required, a tea-spoonful of this medicine and as much antimonial wine, may be taken in water, and repeated in six or eight hours: 30 drops of laudanum sometimes make a useful addition to the first draught.

M. Oil of Mint. This is chiefly used as a cordial. In sickness at stomach, or when medicines such as the bark, &c. cannot be retained, a single drop of this oil added to each dose frequently removes the nausea. Six or eight drops of the oil rubbed with a little sugar and about a tea-spoonful of gum arabic, and then gradually united with a pint of water, makes the mint water, of which one or two table-spoonfuls may be given in pains of the stomach and bowels arousing from wind.

N. Huxham's Tincture of Bark. The quantity of bark contained in this preparation is trifling, being not sufficient to stop the slightest ague fit. A tea-spoonful of it added to the bark, or bitters, may render them more agreeable to the stomach, and somewhat increases their efficiency. When taken occasionally with water, it seems only to answer the purpose of a dram.

O. Spirit of Lavender may be used in the same manner as the above, to render medicines less nauseous to the stomach. In cholic pains a tea-spoonful of it taken in two table-spoonfuls of mint water, with the addition of 30 or 40 drops of laudanum, frequently relieves the pain.

P. Cathartic, or Epsom Salts. A table-spoonful of them dissolved in a little salt or fresh water, operates as a gentle purgative. To render the solution more agreeable to the stomach, a little spirit, lime juice, and sugar, may be added.

Q. Camphor. Six grains of this medicine dissolved in a few drops of brandy, and rubbed with a little sugar and gum arabic, two table-spoonfuls of water being gradually added, may be taken every two or three hours. It frequently removes those violent head-aches so distressing in fevers; and is also serviceable in rheumatic pains. Thirty drops of laudanum and as much spirit of nitre, may occasionally be added to it, and will act very powerfully as a sudorific. A dram of camphor dissolved in two table-spoonfuls of any spirit, or as much palm oil, is extremely useful when well rubbed on parts affected with rheumatic pains, or which have been bruised or sprained.

R. Gentian Root is a very strong bitter. Upon 3 drams of the root, cut small, a pint of boiling water must be poured, and left to stand for twelve hours; after which it may be strained through a cloth for use. The infusion is rendered more agreeable to some persons, by adding to the gentian the outer rind of one or two limes, and after it is strained, two ounce measures of spirit. A wine glassful of this bitter infusion may be taken three or four times a day: it is much preferable to bitters made with spirit alone.

S. Cream of Tartar. This is a very pleasant acid, and when dissolved in water, may be used instead of lime juice as a cooling drink in fevers. Half an ounce, or 6 drams dissolved in warm water is a gentle purge, and is of great use in dropsical complaints, by increasing the quantity of urine.

T. Castor Oil in the dose of one or two table-spoonfuls, is generally a speedy and effectual purgative. When the first dose of the oil has no effect for four or five hours, the same quantity may be given until it operates. The best mode of administrating this medicine, is to put the requisite quantity of it into a wine glass containing a table-spoonful of water, by which means its unpleasant taste is in some degree prevented. To some stomachs the addition of a little spirit renders it more agreeable.

U. Gum Arabic. Half an ounce or an ounce of this gum dissolved in a pint of rice or barley water, may be taken as a common drink in purgings, or long continued fluxes.

V. Bilious or Purging Pills. In all cases of costiveness, and when the bile seems to be too abundant, two, three, or four of these pills taken in the morning will be found of great use. They are prepared as follows: take an ounce of aloes, 2 drams of salt of wormwood, and half an ounce of liquorice, or extract of gentian; mix, and make these ingredients into one hundred and seventy pills.

W. Magnesia. A tea-spoonful taken in water affords relief for the heartburn, or acidity in the stomach. In the dose of 2 or 3 tea-spoonfuls it proves an easy laxative.

X. Salt of Tartar. This chiefly employed in combination with lemon juice, or the concrete acid of lemons, as directed (page 20). The compound is more grateful and more advantageous, if taken while in a state of effervescence, immediately as the ingredients are added together.

Y. Diluted Vitriolic Acid. From 10 to 30 drops of this acid may be taken in water two or three times a day. When taken along with the bark it is a good auxiliary and often prevents the costiveness which the bark alone would occasion. Its use in combination with magnesia is mentioned (page 20).

Z. Dilute Nitrous Acid. This acid strengthens the stomach, and is a powerful antiseptic. An useful beverage for person affected with putrid fevers, or with the first symptoms of scurvy, may be made by putting 30 drops of it, or somewhat more, to a quart of water, and adding sugar enough to suit the patient's taste.

Both the above acids are best kept in phials, having ground glass stoppers; and they should be dropped out of the bottle with attention, as they injure the colour and texture of all woollen or linen cloth on which the fall.

External Applications. indicated by Numerals.

Note: The following text is taken verbatim from Winterbottom's *Medical Directions &c.*

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No.1 Cerate. A little of this ointment spread upon lint, tow or rag, is a good application to wounds, ulcers, &c. This and all other dressings should be laid lightly over the surface, not pressed in between the edges of the sore. When spread upon cloth, it is also a good application after a blister; if any water be retained in the blistered part, the vesications may be snipped with a pair of scissors to let it out: but the skin must not be removed, as it serves for a defence to the tender parts underneath. A plantain leaf makes a cool and pleasant dressing for a blister.

No.2 Simple Ointments may be made by melting together as much yellow wax and oil as will become sufficiently stiff for an ointment. They are useful for nearly the same purposes as the last article.

No.3 Red Precipitate is a very beneficial application to foul ulcers. One dram of it mixed with an ounce of the last mentioned ointments, forms one of the best common dressings for them. When the sore is covered with a foul, dead skin or slough, a little precipitate sprinkled over it renders it clean and makes it look red and healthy. By the same means the new flesh, or as it is called, the proud flesh, is prevented from rising above the proper level.

No.4. Blue Vitriol. Two drams of this dissolved in an ounce of water, may be applied by means of a little lint, to the edges of ulcers where there is proud flesh. Or a piece of lint the size of the sore may be dipped in the solution and laid over its surface: if the new flesh still continues too high, it may be repeated at the next dressing, or as occasion may require.

No.5. Blister Plaster. This must be spread upon thin leather, but not with a hot knife, which would destroy the power of the flies.

No.6. Powdered Spanish flies. In order to render the effect of a blister stronger, and the more certain, some of the powdered flies may be sprinkled over its surface and well pressed in with the finger. Blisters require in general twelve hours to produce their effect.

No.7. Extract of Lead. two or three spoonfuls of this mixed with a quart of water (or half water and half vinegar); two tablespoonfuls of spirit being added, form Goulard's lotion. It is very useful for sprains, &c. Cloths wet with this lotion must be kept constantly applied to the part, and moistened as often as they become warm or dry. Twenty drops of the extract added to two ounce measures of rainwater, make a cooling wash for sore eyes.

No.8. Sugar of Lead is used in the same manner, and in the same cases as the last. Two drams of it may be added to a quart of water.

No.9. Spirit of Hartshorn a table-spoonful of it mixed with as much oil, or common spirit, is employed with advantage to rub bruises or sprains, after the heat and tenderness of the part have been abated by the application of Goulard's Lotion for a few days. It is likewise useful when applied to the nostrils, or rubbed on the forehead and temples in head-ache, faintings , &c

No.10. Flowers of Sulphur This, when rubbed up with butter, or simple ointment, is applied to the spots in the Crawcaws or itch, which it presently cures. One or two tea-spoonfuls of the powder mixed with a little molasses is a gentle purge, frequently found useful in the piles.

No.11. Sticking plaster spread on cloth

No.12. Tow, lint, rags

Appendix 2

Compiled from Estes J W. *Dictionary of Protopharmacology, Therapeutic Practices, 1700-1850.* Canton. USA: Science History Publications, 1990.

Intro-duced	*TMW s nomenclature*	*Rx. =radix or root*
	Preparations for Internal Use	
1630s	Pulv. Peruvian bark	*Cinchona* spp.
1788	Pulv. Angustura bark	*Cusparia angustura* or *Galipea officinalis*
1671	Pulv. Colombo	*Rx.Swertia caroliensis (*aka. *Jateorhiza palmata)*
	Pulv. Rhubarb	*Rx.Rhei officinalis*
1640s	Pulv. Ipecacuanha	*Rx.Cephaelis ipecacuanha*
1631	Tartar emetic aka Antimonium tartarisatum	Antimony potassium tartrate
	Antimonial wine	Antimony in Spanish white wine
	Opium	Exudate from dried seed of *Papaver somniferum*
	Laudanum aka Tinct. Thebaica	Tinct. Opium-variable opium content
1595	Calomel	Mercurous chloride. HgCl.
1650	Sweet spirit of nitre	Nitrous acid
	Oil of mint	Peppermint or Spearmint
	Huxham's tinct. Bark	A trifling amount of Peruvian bark in alcohol
	Spirit of lavender	From flowering spikes of *Lavendula*
1695	Epsom salts aka Magnesium vitriolata	Magnesium sulphate
	Camphor	*Extr. Cinnamomum camphora.*
	Gentian root	*Rx. Gentiana lutea.* (other var. of *Gentiana)*
	Salt of Tartar	Potassium tartrate
	Dil. vitriolic acid	Sulphuric acid
	Dil. nitrous acid	Spirit of nitre

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Intro-duced	*TMW's nomenclature*	*Rx. =radix or root*
	Externals	
	Cerate	beeswax
	Simple ointment	beeswax & oil
	red precipitate	red mercuric nitrate
	blue vitriol	copper sulphate
	Pul. Spanish flies	*Cantharidis vesicatoria*
	Extr. Lead	
	Sugar of lead	Cerrussa acetata, lead acetate
	Spir. Hartshorn	powdered horn
	Flowers of sulphur	Sublimated sulphur
	Sticking plasters	
	Tow, Lint, rags	

References and Endnotes

1. This article is based on a paper read at the Annual Spring Conference of the British Society for the History of Pharmacy 2010, held in Llanelli.

2. Gordon EC. Sailors' Physicians: Medical Guides for Merchant Ships & Whalers, 1774-1864. *J Hist Med & allied Sci* 1993; 48: 139-156.

3. Falk ND. *The Seaman's Medical Instructor.* London, 1770, and Northcote W. *The Shipmasters Medical Assistant.* London 1777, *The Marine Practice of Physic & Surgery.* London, 1770.

4. Winterbottom TM. *Medical Directions for Navigators and Settlers in Hot Climates.* London: Phillips, 1803.

5. The Sierra Leone Company was a commercial venture with the intent of developing trade with West Africa that was an alternative to slave trading. It was set up by Henry Thornton, Granville Sharpe, William Wilberforce, Thomas Clarkson and others in the 1790s. They hoped to establish a colony in Sierra Leone, which would become commercially and economically self sufficient. Freed black American slaves, who had fought for the British in the American War of Independence, had been settled, rather unhappily, in Nova Scotia until the Sierra Leone Company through their envoy John Clarkson, Thomas' brother, offered them a new life in Africa. About 1400 persons accepted and sailed from Nova Scotia with John Clarkson for Freetown. The 'servants of the Company' were all white and some had a military background. A number of poor Londoners were also involved in the scheme.

6. Wadstrom C B. *An Essay on Colonisation.* London: Vol.i. 1794; Vol.ii.1795; (Reprinted by Augustus M Kelley, New York. 1968). ii. 8 fn, 239fn.

7. See Indices in: Watt James. *Journal of Mr James Watt in his expedition to and from Teembo in the year 1794.* Published as *Journal of James Watt. Expedition to Timbo, Capital of the Fula Empire* in 1794. Edited with an Introduction by Bruce L Mouser. Madison: University Wisconsin Press, 1994 and Afzelius Adam. *Sierra Leone Journal 1795- 1796.* Edt. KUP, AP. Studia Ethnographia Upsaliensia xxvii. London: 1967. 2 vols bound in one, continuous pagination throughout.

8. The apothecaries' symbols for ounce, drachm and scruple are not readily available on word processors but can be found at http://en.wikipedia.org/wiki/Apothecaries'_system.

9. Grain weights were thin pieces of brass with dots upon them, to denote how many grains each weighed.

10. The late 18th century London physician Sir John Lettsom, a Quaker and founder of the London Medical Society, was impugned in a scurrilous rhyme of the times

When any sick to me apply, I physicks, bleed & sweats 'em.
If, after that, they chuse to die- What's that to me, I Lettsom.

11. Portable soup was introduced to the Navy in 1757, and compounded from animal offal, salt and vegetables, then evaporated down to form hard glue-like cakes. (Carpenter K J. *The History of Scurvy and Vitamin C.* Cambridge: University Press, 1986: 66.) It was erroneously thought to have an anti-scorbutic effect.

12. In the 1750s the recommended issue was 50lb portable soup for every 100 men in ships of the Royal Navy. http://lewis-clark.org/content/content-article.asp?ArticleID=2128 accessed 12 Jul 2010.

13. Concrete of acid of Lemon was an attempt to preserve concentrated lemon juice. As ascorbic acid deteriorates rapidly, especially when heated, concrete of acid of lemon was almost certainly useless as an antiscorbutic before 6 months had passed. The anti-scorbutic effects of fresh fruit and vegetables, especially lemons and other citrus fruits had been demonstrated by Lind in 1750s. Nonetheless citrus fruit did not appear in stores manifests of Royal Navy vessels until 1795 (Blane).

14. Reference 4: 139.

15. Estes JW. *Dictionary of Protopharmacology, Therapeutic Practices 1700-1850.* Canton USA: Science History Publications, 1990, *passim.*

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Black eye cosmetics of ancient Egypt

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The colour black,[1] when used for eye cosmetics ('kohls') in dynastic Egypt, was a common colour. In the pre-dynastic period, that is 5500 to c. 3100 BC,[2] the colour green predominated for eye cosmetics. Black did sometimes occur in this period, and then increasingly from the 1st to 10th dynasties (c. 3100 to c. 2025 BC), when *both* were sometimes found together as funerary items. Black, with only a very few examples of green,[3] was found from the Middle Kingdom (MK, starts 2055 BC) onwards. The word used in ancient Egypt for 'eye paint' in general and 'black eye paint' in particular was *mesdemet*.

But, why black? Indeed, why change from green to black? A Pharaoh-decided fashion change? Had the easily accessible green surface ores of the eastern desert become exhausted or the (black) lead ore mines, mostly down the west coast-line of the Red Sea, become fully operational? A link to an important temple ritual? A perceived additional use as medicinal eye salves? A reflection of the recognised importance of the fertile black Nile mud? Thus, as an offering to the God associated with the fertile soil of Egypt and especially of the Nile mud, Geb? Perhaps all of the above were involved, over time, in the change of colour for eye cosmetics.

Whatever the reason, it was a popular one. Eighty percent (i.e. 95 of 119) of all the ancient Egyptian eye cosmetics, currently analysed and published, can be described as black.[1] Fifty-nine of the seventy-four analysed by 'wet chemistry' methods,[4] thirty-two of the thirty-seven from the Louvre Egyptian collection in France,[5] and four of the eight analysed by us.[6,7,8,9] These last thirty-six samples were analysed by modern spectroscopic methods.

The black colour of the sample was usually given by the colour of the major component. This applies to all of these (95) samples except for nine samples from the Louvre. These nine samples were black, but the colour arose from the presence of a minor component (the major components all being white or grey-white). This minor component was galena (lead sulphide, PbS). It was also the major component in all of the other (23) Louvre samples, all four of our black samples and in forty-five of the (59) black samples previously studied by 'wet chemistry'. The remaining (14) black major components were: 'oxide of manganese' (i.e. pyrolusite, manganese dioxide, MnO_2) for ten samples, magnetite (an iron oxide, Fe_3O_4) for two samples, plus tenorite (a copper oxide, CuO) and stibnite (antimony sulphide, Sb_2S_3) for one sample each. Thus, overall, for the ninety-five black samples currently analysed the colour arises from the presence of galena in 81 (i.e. 45 plus 32 plus 4) samples (85%), pyrolusite in 10 samples (11%), magnetite in 2 samples (2%) and tenorite and stibnite in one sample each (1% each).

New samples

We have recently analysed twelve kohl samples from the Egyptian collection of The Manchester Museum, University of Manchester (UK). Seven of these samples were black. These seven samples were chemically characterised using three analytical techniques. Quantitative elemental composition was given by the technique of Low Vacuum Scanning Electron Microscopy (LVSEM), and semi-quantitative identification of the crystalline compounds present by the X-Ray Powder Diffraction (XRPD) technique. The third technique used was Quantitative Evaluation of Minerals using Scanning Electron Microscopy (QEMSCAN), which gave quantitative identification of the minerals/inorganic compounds present (crystalline *or* amorphous).[6,7]

The museum's accession number of each of the containers (kohl pots), from which we removed a small sample for analysis, is used to label each sample. Also given is the site where the kohl pot was found and its assigned date. Pictures of only two of the seven pots are shown, these being representative ones (Figures 1 and 2, for pots numbered 149 and 3956 respectively). Also shown is a map of ancient Egypt, with all sites mentioned in this article shown (Figure 3). Figure 4 is of a guest (showing black kohl usage) at a feast for Nebamun, in a tomb-chapel mural dated to the late 18th dynasty. The analytical results for each sample are given in the following way: first the LVSEM results (in decreasing order of elemental weight percent, with the elements in brackets being at less than 1% each), then the combined results of QEMSCAN and XRPD. The former technique, whilst it does give quantitative weight percentages, does sometimes only identify a group of inorganic compounds.[10] The latter technique can identify the *actual* inorganic compound(s) present from this group, provided it is crystalline. Thus we have listed, for each sample, the QEMSCAN results with their percentages and with the XRPD results given in brackets (in decreasing order of their approx. percentages) after any group listed. The detection limit for our XRPD equipment is taken to be 2%, and so all inorganic compounds found (by QEMSCAN) at below this value are only qualitatively summarised.

Results

Sample 149 (Figure 1)

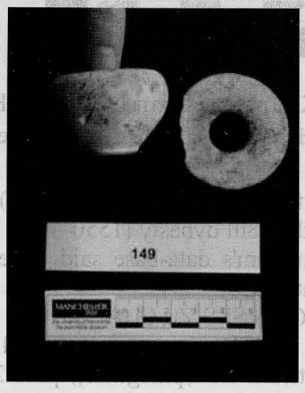

Figure 1. Kohl pot, accession number 149 (MK)
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Its pot was found at Kahun (also, Lahun) and was dated to the 12th dynasty (1985–1795 BC). The pot was thought (by us) to be made of calcite (calcium carbonate, $CaCO_3$).

LVSEM: O, C, Mn, Ca, Pb, S, Cl (Cu, Si, Al, K).

QEMSCAN (XRPD): Manganese oxide/ hydroxide/ carbonate 33.9% {pyrolusite and manganite [MnO(OH)] in approx. equal amounts); calcium sulphates 16.2% (gypsum ($CaSO_4.2H_2O$)}; lead compounds 15.5% [galena, laurionite (PbCl(OH)]; calcite 14.2%; manganese-calcium sulphates 12.8% {possibly the mineral despujolsite, $Ca_3Mn[(OH)_6(SO_4)_2].3H_2O$}; with the remainder being made up of copper chloride(s), quartz (SiO_2), various silicates and possibly a copper sulphide.

Sample 1230

This pot was found at Abydos and was also dated to the 12th dynasty. The pot material was said to be (in the museum's data-base) travertine, which is a form of calcium carbonate.

LVSEM: Pb, C, O, S, Zn, Cl, Si (Ca).

QEMSCAN (XRPD): lead compounds 95.3% [galena, anglesite ($PbSO_4$), phosgenite ($PbCl_2.PbCO_3$), laurionite]; sphalerite (ZnS) 3.1%; with the remainder being quartz and calcium sulphate(s).

Sample 3956 (Figure 2)

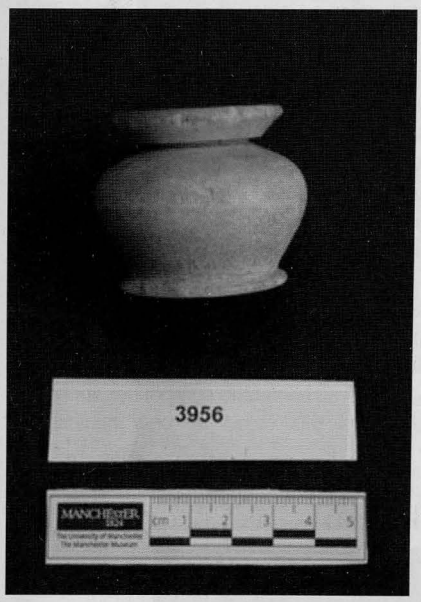

Figure 2. Kohl pot, accession number 3956 (NK)
(© The Manchester Museum, University of Manchester)

The pot was from Isna (sometimes, Esna) and was dated to the 18th dynasty (1550–1295 BC). Again, the museum's data-base said travertine for the pot material.

LVSEM: O, C, Pb, Si, S, Zn, Cl (Al, Ca).

QEMSCAN (XRPD): lead compounds 91.75% (galena, anglesite, laurionite, phosgenite); quartz 2.5%; sphalerite 2.0%; with the remainder being plagio-feldspars (variable formula silicates), calcium sulphate(s), aluminium silicate(s), iron oxide(s)/carbonate(s) and iron sulphide(s)/sulphate(s).

Sample 6986. The pot was found at Sidmant and dated to the 18th dynasty. The museum's data-base said 'limestone (?)' for the pot material.

LVSEM: Pb, O, C, S, Cl, Zn, Ca, Fe (Al, Mg).

QEMSCAN (XRPD): lead compounds 95.9% (galena, phosgenite, cerussite ($PbCO_3$), laurionite); with the remainder being sphalerite, calcium sulphate(s), iron sulphide(s)/ sulphate(s) and calcite.

Sample 7902.b

It is not known where this pot was excavated, and it has been dated to the New Kingdom (NK, 1550–1186 BC) from its style and shape. Travertine was given for the pot material by the museum's data-base.

LVSEM: Pb, O, C, S, Zn, Ca.

QEMSCAN (XRPD): lead compounds 96.0% (galena, anglesite); sphalerite 2.8%; with the remainder being calcium sulphate(s) and calcite.

Sample 10960

The excavation site is again unknown, and it has been dated to the 18th dynasty from the pot's shape and style. Travertine was given for the pot material in the data-base of the museum.

LVSEM: Pb, O, C, S, Zn, Ca.

QEMSCAN (XRPD): lead compounds 94.4% [galena, lithargite (a lead oxide, PbO), anglesite]; sphalerite 2.4%; with the remainder being calcium sulphate(s) and calcite.

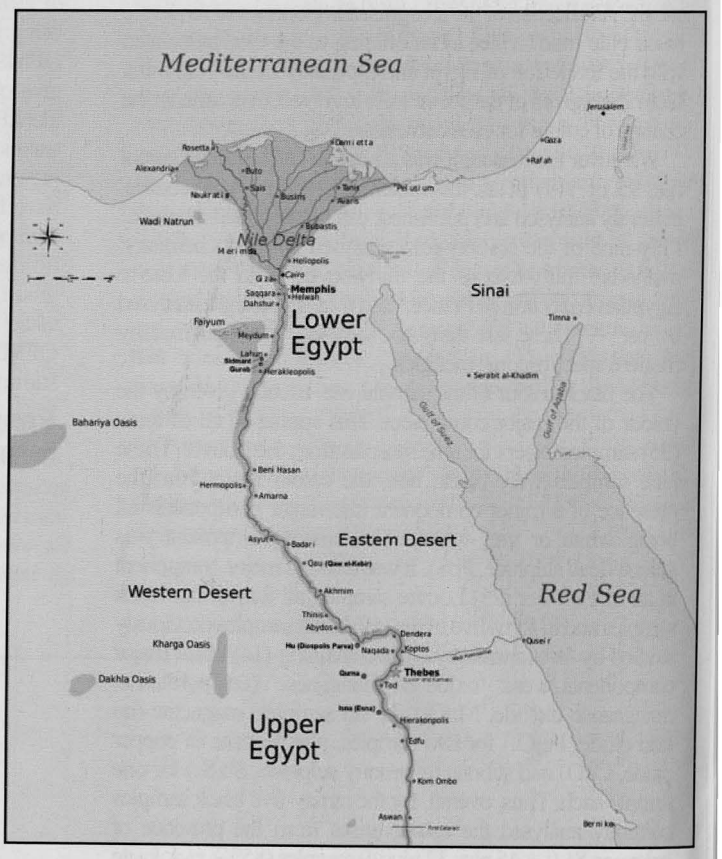

Figure 3. Map of ancient Egypt
(After: Jeff Dahl, Wikimedia Commons)

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Sample 13852

The pot was found at Abydos and dated to the 18th dynasty. Again, travertine was given for the pot material, from the museum's data-base.

LVSEM: Pb, O, C, S, Zn (Fe, Cu, Ca).

QEMSCAN (XRPD): lead compounds 94.9% (galena, anglesite); sphalerite 3.6%; and the remainder being iron sulphide(s)/sulphate(s) and calcium sulphate(s).

Discussion and conclusions

The presence of relatively large amounts of gypsum and calcite in the kohl sample from pot 149 indicates a softer-than-usual pot. Kohl pots, said to be made of calcite, do sometimes have significant (i.e. ≥ 20%) amounts of gypsum present.[6] Gypsum is softer than calcite and so both could be accidently removed when accessing the kohl sample. This is assumed to be the case for pot 149, and the manganese-calcium sulphate found is taken to be either 'manganese-stained' gypsum or possibly the mineral despujolsite. Over almost four millennia of in-situ contact between manganese oxide/hydroxide and gypsum it is thought that the former material could slowly form. The other six kohl pots, all described as being made of calcium carbonate, are of harder material - that is calcite with only small amounts (i.e. a few percent) of gypsum present. Their kohl powders were all found to contain less than 2% each of calcium carbonate/sulphate. Thus all such compounds found in our samples are assumed to be accidental pot contamination material. Other common contaminants, from the local soil, are quartz and silicates.

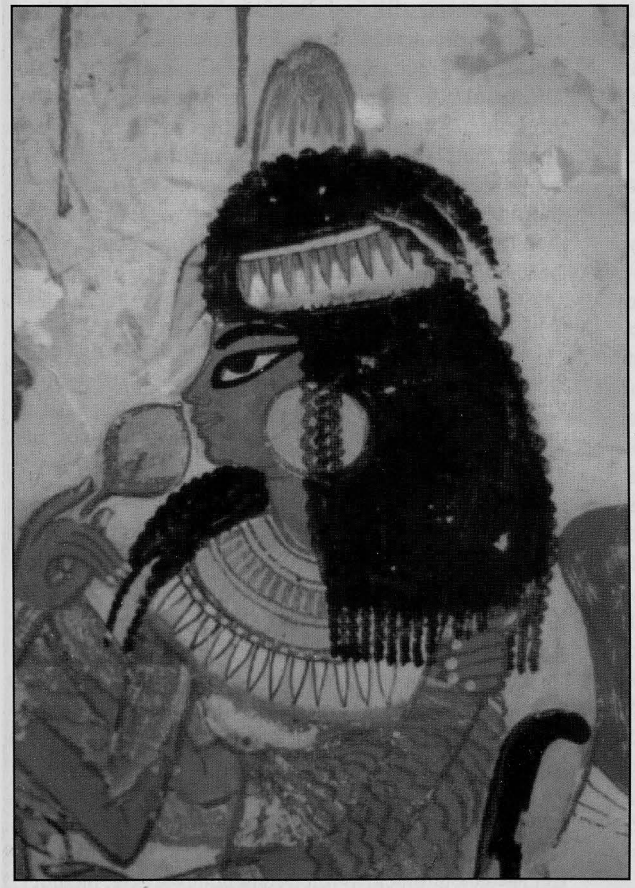

Figure 4. Detail from Nebamun's feast (mural, NK)
(© Dr. Joann Fletcher)

Therefore the main components of the kohl sample in pot 149 were 'oxides of manganese' (i.e pyrolusite and manganite). The lead compounds found as minor components were most likely part of the original manganese ore deposit (possibly in the eastern desert on the Red sea coast), rather than having been deliberately added. The ancient Egyptians probably did have a separate word(s) for their manganese oxide ore(s), *ḥtm* and/or *gsfn* are currently thought to be the most likely possibilities.[11] Both words are found associated with 'black eye paint' (*mesdemet*) and as such could have been used in (eye) medicines[12] or in temple/funerary rituals.[13] Manganese is an essential *trace* element for the human diet, but at higher levels it can give rise to neurotoxicity.[14,15]

The other six black kohl samples studied by us all have galena as their major component. Also, apart from small amounts of pot and soil contaminants as mentioned above, there are also sometimes small amounts (few percent) of sphalerite and iron-sulphur minerals. These, especially the sphalerite, are known to occur with galena ore found in the eastern desert.[16] Anglesite is an expected oxidation/weathering product of galena, and cerussite is also found in the eastern desert – often with galena.[4] Both anglesite and cerussite are white in colour. However, three of the kohl samples (1230, 3956 and 6986) also contain varying amounts of phosgenite and/or laurionite. These are rare lead minerals and it has been shown that they were *made* in ancient Egypt between c. 2000 and 1200 BC and used in kohl.[5,17]

Much time, thought and printed words have been used in discussing these two 'made' lead compounds. We now know the 'how' and the (approx.) 'when' of their manufacture, but are still speculating over the 'why'. Were they specially made as face/eye salve for the elite? Or perhaps mass-produced for all who could afford it? As a special funerary/ritual offering? Or perhaps a combination of some of the above with their use to make 'shades of grey' cosmetics? However, the readily available (white) cerussite ore could easily have been added to black galena to give these 'shades of grey'. Plus, they *did* crush, grind, sieve and (probably) gently heat the galena in order to vary its degree of iridescence.[18] When freshly mined, galena is a highly iridescent silver-grey lump. On crushing and grinding, this iridescence decreases, until at a particle size of less than about ten microns a matt black powder is obtained.[19]

It is currently assumed that these two 'made' lead compounds, which were nearly always combined with at least some galena, were manufactured for their perceived therapeutic and/or prophylactic benefits as eye medicines. Very recently work has been done that indicates that these benefits may well have been 'real'. Using (micro)

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electrochemical analytical techniques it was found that sub-micromolar concentrations of Pb^{2+} would have stimulated non-specific immunological defences when present in (human) lachrymal fluid.[20] These lead ions are formed in aqueous solution, from both the naturally occurring minerals (galena and cerussite) and the man-made compounds (phosgenite and laurionite). However, the solubilities of the 'made' compounds, whilst still low and pH dependent, are greater than for the minerals, especially with respect to galena.[21] It is therefore proposed, in this recent paper, that the ancient Egyptian physicians recognised empirically that adding one/both of these 'made' lead compounds to their black galena-based kohls *did* reduce/prevent bacterial eye infections.

One can even speculate as to how these compounds were first seen. Perhaps a lead miner at a site on the eastern desert's Red sea coast, such as Gebel el Zeit, noticed a 'white encrustation' on lead-bearing rocks that had been periodically covered with warm sea-water or salt spray. Trial and error followed this initial curiosity and eventually a working recipe was obtained. Perhaps the initial synthesis was achieved at the mine site; and perhaps even the original 'white encrustation' powder had been added to the miner's kohl – and found to give 'magical protection' against eye infections. Is it more than coincidence that these lead compounds appear to have been made between c. 2000 and 1200 BC and that the Gebel el Zeit lead mine is estimated to have been systematically exploited between c. 2040 and 1200 BC?[2] Of the fifty lead-based ancient Egyptian kohls analysed since 1999, when the presence of these 'made' lead compounds was first discovered,[22] thirty-three (66%) have some of at least one of them present.[23]

Lead is a cumulative poison and so repeated exposure to lead-containing cosmetics could have resulted in mass lead-poisoning amongst the ancient Egyptians. Symptoms of lead poisoning include: loss of appetite, (stomach) colic, headache and constipation. However, there is no record of such symptoms being experienced, or indeed of any awareness of the dangers of repeatedly using lead compounds where they can be easily ingested. Also, the crushing and grinding of galena, and the mode of preparation of the two 'made' compounds, would have given rise to small particle sizes. These would have been more likely to enter the bloodstream if ingested, via faster dissolution in the stomach's gastric fluids.[24]

However, we must also ask the question: did they, on average, actually experience lead poisoning? Currently, little work has been done on their remains (i.e. hair, bones, teeth), looking for accumulated lead. *Nubian* skeletons' bones and teeth, dated from 3300 BC to 750 AD, have been studied.[25] There *was* a gradual increase in lead found as time passed, with a 'spike' at the Pharaonic period (taken to be 1650–1350 BC by the authors). But, the actual values found were in fact several times smaller than those found in contemporary bones/teeth in the USA and Denmark. More recently, hair from two Greco-Roman (332 BC–395 AD) mummies have been found to contain elevated levels of lead and manganese,[26] compared to currently acceptable values. Thus, further work needs to be done in order to definitively answer the above question.

Black was a common colour for eye cosmetics of ancient Egypt. Its major component was often galena, and even as a minor component it could give the sample its black colour. If we now include the samples mentioned in this paper then 102 of the 131 kohl samples analysed are black; at 78% a slight reduction from the previous value of 80%. The percentage of these 102 where the black colour is given by galena remains at 85%. Both of these percentages are higher than for the kohls of modern-day Egypt. Twenty-one (51%) of the forty-one modern-day kohls analysed are black; where eleven of these twenty-one (i.e. 52%) have this colour from galena and the remaining ten from amorphous carbon.[6,9] The man-made variation in iridescence of the galena is still found today, but the 'made' lead chlorides are no longer present. More analyses, from before 2000 BC and after 1200 BC, need to be done. The results to date show that approx. two-thirds of the kohls, from *between* the above dates, contained one or both of these 'made' compounds, probably being added for medicinal reasons. However, it should not be forgotten that the main reason, now and then, for the use of black eye cosmetics was/is to look good and so 'enhance the being'.

Acknowledgements

We thank Dr Karen Exell, the curator of the Egyptian collection at Manchester Museum, for all her help in this project. Also, we would like to thank the staff of the Chemical and Materials Analysis Unit (University of Newcastle, UK) for most of the experimental LVSEM work mentioned in this article.

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Endnotes and References

1. The colour black, as referred to in this article, includes: grey-black, steel-grey and grey.
2. All the dates used in this article (plus information on Gebel el Zeit) are from: Nicholson PT and Shaw I. *British Museum dictionary of ancient Egypt.* London: British Museum Press, 2nd edn, 2008: 126, 350-354; and references therein.
3. The green eye cosmetic (*wadju*) did linger on and was occasionally found in Middle and New Kingdom sites and tombs. Its last known occurrence was in the 19th dynasty (1295–1186 BC).

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4. Lucas A and Harris JR. *Ancient Egyptian Materials and Industries.* New York: Dover Publications, 4th edn, 1962: 80-84, 243; and references therein.
5. Some ancient Egyptian cosmetics from the Louvre have been analysed, using modern synchrotron spectroscopic methods, by a group funded by L'Oreal and the French Government. The only English-language summary of results to date, for 37 samples, is in: Dooryhee E. Advances in Art and Archaeology using X-ray synchrotron radiation. In: Tsoucaris G and Lipkowski J (eds). *Molecular and Structural Archaeology: Cosmetics and Therapeutic Chemicals*. Kluwer Academic Publishers, 2003: 201-209. We have assumed that when the percentage of galena in a sample is less than 10% then the sample's colour is no longer black --- as defined in Endnote 1.
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16. Martinetto P, Anne M, Dooryhee E et al. Synchrotron X-ray micro-beam studies of ancient Egyptian makeup. *Nucl Instr Meth Phys Res B* 2001; 181: 744-748.
17. We do not know exactly how they made laurionite and phosgenite in ancient Egypt. We *do* know how they were made centuries later, and it is assumed that similar methods were used in Pharaonic times. Dioscorides (c. 40 BC–c. 50 AD) describes the process for making laurionite in Book 5 of his *Materia Medica*. Essentially some silver foam (lead oxide, PbO) was mixed with some rock salt (sodium chloride, NaCl) and warm water. This mixture was then 'beaten three times a day', followed by 'straining out of the old' (liquid) and adding more warm water. This was continued for 30 days; the white solid produced was laurionite [Pb(OH)Cl]. Using natron (mostly sodium carbonate and bicarbonate, Na_2CO_3 and $NaHCO_3$) in addition to rock salt would have produced phosgenite ($PbCO_3.PbCl_2$).
18 Ungar T, Martinetto P, Ribarik G et al. Revealing the powdering methods of black makeup in Ancient Egypt by fitting microstructure based Fourier coefficients to the whole x-ray diffraction profiles of galena. *J Appl Phys* 2002; 91(4): 2455-2465.
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21. The solubility products (K_{sp}) of galena, cerussite, laurionite and phosgenite are: $1{\cdot}25.10^{-28}$, $6{\cdot}3.10^{-14}$, $1{\cdot}0.10^{-13.4}$ and $1.0.10^{-99}$ respectively.
22. Walter P, Martinetto P, Tsoucaris G et al. Making make-up in Ancient Egypt. *Nature* 1999; 397: 483-484.
23. These numbers are made up as follows: for the number of lead-based kohls analysed since 1999 we have thirty-seven from reference 5 plus a total of seven from references 6, 8 and 9, and another six from this article. For the number definitively containing one or more of the two 'made' lead compounds we have twenty-nine from reference 5, one from reference 6 and three from this article.
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Charles W. White and Walter White: Colonial Commercial Travellers

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In pre-colonial India the traditional systems of medicine practised were Ayurveda and Siddha, which originated in the country, and the Unani, a Greco-Arabic medical system, which came from West Asia.

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The practitioners of these medical systems were their own pharmaceutists as well, preparing themselves the remedies for their patients. Generally there was no commercialisation or large scale production and distribution of the drug preparations.

The position was different with regard to the western medical system which came in with the colonisers.[1] The drugs required to keep the new system going were generally not available in India and had to be imported from overseas. Gradually the era of modern pharmacy arrived.[2] From the early nineteenth century pharmacy houseswere started, which were generally managed by the British.[3] In later years certain of these establishments came under Indian management.[3,4] There also emerged firms with Indian ownership, maintained under Indian management. The drug trade became a flourishing business. The western drugs and ancillary supplies came from abroad.[5]

The western medical system became the official system of health care and had to remain dependent on imports of the drugs. By the end of the nineteeth century there were some pharmaceutical manufacturing firms, but on the whole the industry continued to be at a rudimentary state till independence of the country. It is understandable that the drug trade in the colonial days was largely with Britain. The principal British drug houses eyed India for exports. For promoting their products they had their representatives visit the country to solicit and expand the business.

Charles W White.

Among such representatives, the one who was most successful and popular with chemists and druggists in India was Charles W White.[6-18] He figured more often in the professional journals, covering his commercial travels.

He travelled extensively in India and Burma and there are references to his visits to Bombay, Goa, Madras, Calcutta, and Peshawer in India and Rangoon and Mandalay in Burma.

He represented several British firms, including Burgoyne, Burbidges & Co., Burroughs, Wellcome & Co., A & F Pears, Seabury, E A Hearn & Co., etc. White was very popular and his visits were appreciated. He was considered to be the 'doyen of Indian drug travellers,' 'indefatigable,' 'affable' and a 'most successful commercial traveller.'

Charles W. White, F.R.G.S.[18]

Charles White

It seems that Charles White started working as a sales representative in late 1880s. This derives from the wording of an address presented to him by the local Drug Bazar Association on his reaching Bombay in January 1914. It mentions that White had been known to the membership of the Association 'for more than twenty–five years'.[18] The first two entries in the list of the supporting references on his work are of the year 1887.[6,7] No material further to what is cited above has become available about Charles W. White

In later years the name of Walter White started appearing[19-22] He was also noted to be an 'esteemed representative' with Walter White and M K Shah, a resident agent for Bombay with an'unrivalled knowledge of the subject'.[19] Among the firms he represented were Burgoyne, Burbidges & Co., Bovril Ltd., Fletcher & Co. Ltd., Savory & Moore Ltd., etc.[20-22] It seems that he started visiting India from 1912 onwards.[22] Walter White passed away in London on 10 December 1938 at 76 years of age.[22] His work in India was to be continued by his son William H White. From the information available it is not clear as to what relation Walter

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Walter White[21] 1862-1938

White had with Charles W. White. Before studying all the cited material, it looked as if the references pertained to the same person, Charles W. White, thinking that in his name the middle W. initial possibly stood for Walter, which in later years was adopted, dropping the first name Charles.

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12. *Chem Drugg* 1894; 45: 572.
13. Wm Mair. Pharmacy in India. *American Druggist and Pharmaceutical Record* 1896; 29(4): 96-100. 14. *Indian J Pharmacy* 1896; 3(1): 20.
15. *Chem Drugg* 1906; 68: 329.
16. *Chem Drugg* 1911; 78: 234.
17. *Chem Drugg* 1911; 78: 461.
18. *Chem Drugg* 1914; 84: 257.
19. *Indian and Eastern Druggist* 1921; 2: 194.
20. *Indian and Eastern Druggist* 1925; 6: 253.
21. *Indian and Eastern Druggist* 1935; 16: 167.
22. *Chem Drugg* 1939; 130: 144.

Harry Cooper 1888-1935

Prof. Harkishan Singh

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During early part of the twentieth century Harry Cooper, a British pharmacist, had a significant role in the development of pharmacy in colonial India. He came to India in 1919 to serve the Calcutta firm Smith, Stanistreet & Co. Ltd., manufacturing and wholesale chemists.[1] Under Cooper's care, the Company became a prominent drug industry at Calcutta. Cooperalso got closely associated with professional activities.[2-4]

He was a native of Hythe, Kent and studied at Elementary School, Sandgate, which he left to enter pharmacy at the early age of fourteen. He went through an apprenticeship and served four years with a local chemist at Hythe.[3] He qualified for the minor and major examinations of the Pharmaceutical Society of Great Britain in 1912 and 1913, respectively.[5] He passed the examinations at the first attempt.[3]

Cooper joined the service of Burroughs Wellcome & Co., Manufacturing Chemists, Dartford, in August 1913.[3] He

Harry Cooper[9]

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remained there for six years and gained experience in analytical and manufacturing methods. During the war years he was fully engaged in important work connected with medical supplies. He spent his leisure time in military training with 4th Volunteer Battalion of the Royal West Kent Regiment, one of the platoons in the Dartford company being made up solely of employees of Burroughs Wellcome & Co. Cooper attained the rank of sergeant..

In August 1919, after his marriage to Daisy Prosser, a former colleague, Cooper proceeded to India to work with the Smith, Stanistreet & Co. as their chief chemist.[2,3] He became a Fellow of the Chemical Society in 1919.[3]

At Calcutta, in addition to his service to his company, Cooper engaged himself in professional activities and rendered valuable service to pharmacy in India.[2,3] He was associated with certain professional bodies and worked on an important governmental committee. In the late 1920s a few chemists associated with industries and technical laboratories at Calcutta felt the need of an organisation of chemists with a bias for applied chemistry.[6] Cooper was a member of the group which worked out the formation of the Institution of Chemists (India). He became one of the two first honorary secretaries and he held the position for five years (1928-29; 1930-34). For the period 1929-34, the office of the institution operated from Smith, Stanistreet & Co. He also became vice-president of the Institution.[3] As a founding pioneer, Cooper helped to consolidate the functioning of this institution which continues to work for the cause of applied chemistry.

The Banaras Hindu University, which was running a BSc (Pharmaceutical Chemistry) course was helped by Cooper as a co-opted member of the Faculty of Science, a member of the Board of Studies in the subject, and examiner for the degree course.[2-4] Cooper also gained prominence for his participation in the chemical and pharmaceutical trade activities.[2,3] Professionally he chose to work with the Bengal Pharmaceutical Association, which elected him as the president in March 1935.[22]

The most enduring contribution Cooper made to the development of modern pharmacy in India was as a member of the history-making Drugs Enquiry Committee 1930-31 which the Government of India appointed.[7] The Committee was chaired by Colonel Ram Nath Chopra of the Indian Medical Service (IMS) (School of Tropical Medicine, Calcutta). The Committee embarked on an intensive tour of the country to examine witnesses and to visit selected institutions. The Committee made several important recommendations. It was recommended that there should be central legislation to control drugs and pharmacy. To advise in making rules for carrying out the objects of the act, the creation of an advisory board was recommended and a central laboratory was required to be established. The compilation of an Indian Pharmacopoeia was recommended. Based on the recommendations of the Committee the system for controlling drugs and regulating pharmacy was gradually structured, in part during the colonial period and mostly after independence. In the twentieth century pharmaceutical annals of India, the establishment of the Drugs Enquiry Committee proved to be the most significant event.

Cooper was at the peak of his professional career and could have further added to the pharmaceutical developments, but the destiny willed otherwise. He was only 47 years of age when he died suddenly on 28 August 1935.[2-4,8] His death in Calcutta followed an operation for appendicitis.[3] He left behind his widow and a son. At the time of his passing, Cooper was the Works Manager and Director of Smith, Stanistreet & Co.

Harry Cooper had considerable knowledge and experience of both chemistry and pharmacy.[3] He was keenly interested in raising the status of pharmacy in India, a man of strong character, very hard-working, robust and utterly fearless.

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The collection of source material for this paper became possible through support from the Indian National Science Academy for my research on history of pharmaceutical developments, which is gratefully acknowledged.

Endnotes and References

1. Singh, Harkishan. *History of Pharmacy in India and Related Aspects, Volume 3*: *Pharmacy Practice,* Delhi; Vallabh Prakashan, 2002, 73-76. The beginning of the company is traced to the early part of the nineteenth century. Originally a retail pharmacy, it later started concentrating on manufacturing. In 1915, the firm operated from Convent Road, Calcutta. In 1918, it was converted to a limited liability concern.

2. *Indian and Eastern Druggist* 1935; 16: 200.

3. *Journal of the Chemical Society* 1935; 1898.

4. *Chemist and Druggist* 1935; 123:393.

5. Letter from the Museum of the Royal Pharmaceutical Society of Great Britain, dated 20 August 1999 from Lorraine Jones, Assistant Curator. Harry Cooper registered as a chemist and druggist, certificate number 18897, on 10 July 1912, having passed the minor examination, and a pharmaceutical chemist, number 3485, on 7 April 1913, on passing the major examination. On registration in 1912, his address was Sunnyside Cottage, Beaconsfield Terrace, Seabrook, Hythe. In later years his address changed to Smith, Stanistreet & Co., 18 Convent Road, Entally, Calcutta.

6. *Diamond Jubilee Brochure. Institution of Chemists (India), 1928-1988*. 2, 5.

7. Singh, H. Drugs Enquiry Committee, *Eastern Pharmacist* 2001; 44(11): 21-25. In addition to Col. Chopra and Cooper the other two members of the Committee were Reverend Father J. F. Caius (Haffkine Institute, Bombay) and Maulvi Abdul Matin Chaudhury, MLA. H. Govindan Nayar worked as the Secretary and Dr B. Mukerji as Assistant Secretary of the Committee. Bt. Col. R. N. Chopra was knighted in 1941.

8. *Pharm J* 1935; 135: 283.

9. Image extracted from a group photo of the Drugs Enquiry Committee and others in the *British and Colonial Druggist* 1931; 84:148.

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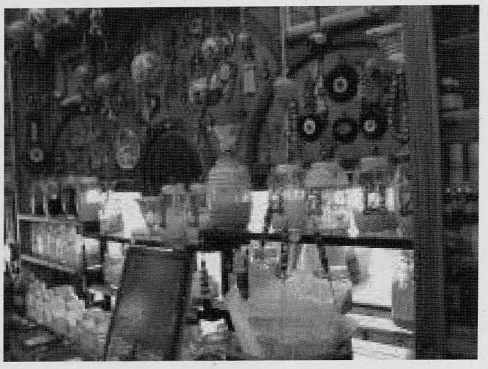
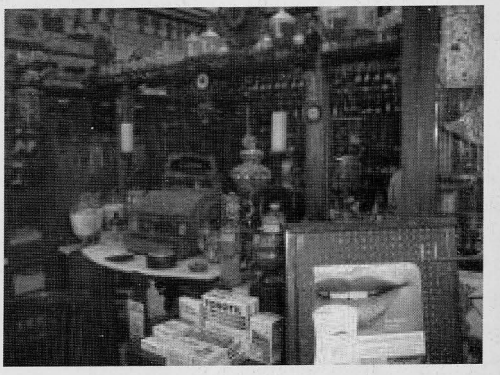
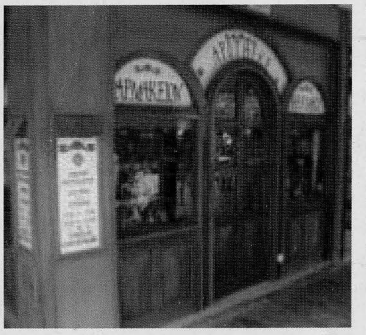



The Nikos M. H'Antoniades pharmacy in Kalithea, Rhodes contains historic pharmaceutical and medical items collected by the family over many years.
Photos: Peter Worling



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British Society for the History of Pharmacy

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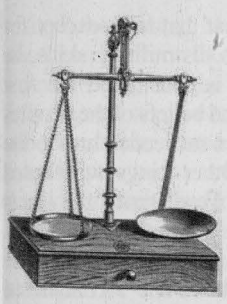

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Contents

Diary

Because of revised charges for Wednesdays at the RPS, Lambeth, the longstanding arrangements for meetings have been reconsidered by the Committee. ***Note earlier starting time and change of date for meetings***

Wednesday 22 June 2011 Visit to Keats House, Hampstead, NW3 2RR. See circular.

Monday 10 October 2011

'The History of Medicines Registration' by Diane Leakey. 5.00 at Lambeth.

November 2011

'The History of the Great Hospital, Norwich'. At the University of East Anglia. Details to be confirmed by circular.

Future dates

6 February, 14 May, 8 October 2012 to be confirmed.

British Society For The History Of Medicine: 24th Congress, 31 August-3 September, 2011

University of Surrey, Guildford. Details available from: BSHMCongress@hotmail.co.uk or Mrs. Elizabeth Wood Congress Administrator, Society of Apothecaries, Black Friars Lane, EC4V 6EJ, Mobile 07748663428. Messages can be left at 020 7236 1189.

40th International Congress for the History of Pharmacy, Berlin, 14–17 September 2011: Pharmacy and Books

To be held at the Berlin-Brandenburg Academy of Sciences and Humanities, Markgrafenstraße 38, 10117 Berlin. Full details of the congress programme and the excursions for accompanying persons, with a booking form, can be found at www.40ichp.org/

Letter

I read Dr Malcolm Brown's article (*Pharmaceutical Historian* 2010; 40 (4), 69-74) with great interest as a museum professional with objects at the centre of both my training and working life.

It goes without saying that the defining characteristic of a museum is its collection of objects, a three-dimensional archive reflecting the history of a locality, practice or profession. This concentration of objects is particularly enlightening in the consideration of past, present and future pharmacy for all of the reasons that Dr Brown describes.

The Royal Pharmaceutical Society's Museum collection is rich in 'ingenious' designed objects developed as solutions to particular problems – powder folders, root cutters, tablet cutter and 'pill (sic) poppers'. The extensive array of medicines present both content and container for investigation. The representation of pharmacy to itself and to others is clear from the charter that Dr Brown examines, but also via other artefacts from headed paper to shop fittings, and from adverts to photographs.

Museum collections like the Society's allow the understanding of pharmacy through its solid material culture in a way that memories and written accounts can never do. These sources complement each other. Artefacts elicit an enriched reminiscence from a pharmacist, intrigue a current designer of gadgets or graphics, or amaze a student of medicine, history or science. Guardianship of this three-dimensional history of pharmacy is essential to the capture of a rounded picture of the profession and practice for current and future pharmacists and researchers. **Briony Hudson**

BSHP Officers 2011-2012

The Committee has elected Mr Trevor Whaley (President), Briony Hudson (Vice-President), Peter Hoan (Secretary), Roger Mills (Treasurer).

Correction

In the article on 'Charles White and Walter White' in the March 2011 issue, vol. 41, pp. 13-15, on p. 14, col. 2 the heading should read 'Walter White' and be placed above the succeeding paragraph. The caption for the picture in col. 2 should read 'Walter White and M K Shah, a resident agent for Bombay.'

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Cosmetic sciences from ancient Persia

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Persia's history goes back to about 10,000 years ago[1], and the Persian Empire played an important role in the development of scientific knowledge on a worldwide level. However, Iran's geographical location exposed the region to repeated attacks by neighbours throughout its history. As a result most written evidence of life during ancient times (from the prehistoric period to 627 AD) has been lost. The lack of subsequent studies of the history of sciences in ancient Persia has left gaps in our knowledge, and one area in particular where information is scarce is the manufacture and use of cosmetics.

Cosmetic sciences in other civilisations have been relatively well studied, e.g., hair styling in Egypt (3000 BC)[2, 3] and in Rome and Greece.[3]

Stone reliefs at Persepolis illustrating elaborate hair and beard make-up show evidence of a sophisticated degree of knowledge about cosmetics in the Persian Empire. In addition, a number of words in the Pahlavic language are further evidence of the importance of cosmetics in ancient times. For example, *pēsitan* and *azrāyitan* in Pahlavi mean 'make-up', *wars* and *mōy* means 'hair', *bōy* means 'perfume', *gohr* means 'jewellery' and *post* means 'skin'.[4, 5]

This article offers a brief overview of cosmetics in ancient Persia. For background information on the history of ancient Persia, a brief history follows.

Pre-Median Empire: This period comprises the beginning of Persian history to the founding of the Median Empire. The predominant cultures were territorial civilizations such as the Sialk, Ilamians and Act.[1, 6]

Median Empire: The first Persian Empire was ruled by Dyokus, first king of Median. He united the Median tribes and organised the Median government to repel Assyrian forces. After him, King Kyaxar conquered the Assyrian Empire and transformed the Median government into a large, powerful empire. Cyrus the Great, Prince of Pars, revolted against Astyages, the last king of the Medians, and his rule succeeded the Median Empire in 550 BC.[1]

Achaemenid Empire: Cyrus the Great, from a region in southern Persia now part of Fars province, and founder of the Achaemenid Empire, revolted against Astyages and defeated him in 550 BC. Thereafter he waged war on neighbours including the Lydian Empire, Babylonians and the endemics in eastern Iran and captured their territories. These conquests made Cyrus the Great king of the entire modern world known at that time except for Greece and Egypt. In addition to his military skills, he was also a great humanist, and is considered the first emperor to respect the religions and beliefs of the peoples he conquered. His son Megabyses succeeded him to the throne and conquered Egypt. Other kings who ruled during the Achaemenid Empire were Darius the Great and Xerxes, who conquered Athens (480 BC). Alexander, king of the Macedonians (Alexander the Great) brought on the downfall of the Achaemenid Empire in 330 BC.[7, 8]

Seleucid period: Alexander was succeeded in 247 BC by Seleucus, a commander in his army as ruler of the Persian territories. The Seleucid period came to an end with the advent of the Parthian Empire.[8]

Parthian Empire: Arses, the first king of the Parthian Empire, revolted against the Seleucid kings and established the independent territory of Parthia (now Khorasan province in Iran). Later Parthian kings captured other parts of Iran and marched to the Euphrates River. Beginning in 69 BC, forces of the Roman Empire marched east toward Asia and fought the Parthians. At the famous Battle of Harran between the two Empires, the Persian commander Surena defeated the Roman forces led by Crassus in 53 BC. Nearly 300 years later, Ardeshir revolted against the Parthian Empire and defeated the Parthians in 224 AD.[9]

Sassanid Empire: Ardeshir, a local lord from the Pars region, revolted against Ardevan V, the last king of the Parthian Empire, and established the Sassanid Empire upon capturing the Parthian territories in their entirety. The rulers of this new empire battled the Romans several times. During this period, Persia saw the development of highly advanced medical centre and universities such as the Gondishapour (Jondishapour) Academy, a flourishing centre for medical sciences. Famous kings of the Sassanid Empire were Ardeshir I, Shapour I, Shapour II, Khosrow I and Khosrow II. The Sassanid Empire came to an end in 637 AD with the invasion of the Muslim Arab forces.[10, 11]

Methods

As the first step we compiled a collection of photographs related to cosmetics in ancient Persia by travelling to ancient provinces and visiting historical areas, monuments and museums throughout the country. The most informative sites in Fars province: Persepolis, Passargad, Tang-e-Chogan, Shapour Cave, Naghsh-e-Rostam, and the museums of Persepolis, Pars, and Narenjestan-e-Ghavam. In Khuzestan province we visited Susa and its museum, Haft Tapeh, and Chaghazanbil. In Gilan province we visited the Rasht museum; in Hamadan province we visited Hegmataneh and its museum; and in Isfahan province we visited the Museum of Decorative Arts. In Tehran province our sources were the National Museum and Reza Abbasi Museum; in Yazd province we visited the Heidarzadeh Coin Museum, the Vaziri Museum and the Light Museum; and in Azarbaijan-e-Sharghi province we

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visited the Tabriz Museum. In addition, we studied photographs from the Gullrum Gottland (Sweden) the Louvre (Paris) and the British Museum (London).

In the next step, we analysed existing ancient manuscripts and documents. These included inscriptions and Persian manuscripts such as the Gathas of Zoroaster, the Ardaviraznameh, the Bondahesh, the Vandidad, most of the Nasks of the Avesta and the Shahnameh. We also studied Roman and Greek manuscripts relating to Persia, such as the writings of Herodotus, Xenophon and Plutarch. Contemporary researchers whose work we consulted were Koch, Christensen, Diakonov and Shimmpann.

We compiled information obtained from all sources into 8 sections covering: 1. hair, beard and eyebrow make-up, 2. Montmorillonite (shampoo), 3. peeling agents, 4. hair and skin colourings, 5. perfumes, 6. oils, 7. cosmetic vessels, and 8. decorative tools.

Results

1. Hair, beard and eyebrow make-up

1.1. Evidence

One of the most important sources of evidence of cosmetic use is the stone sculptures and reliefs in Persepolis. The curled hair and beard of Persian men of state is striking. The best illustration is the relief of Darius the Great (Achaemenid emperor) located in the treasury in Persepolis. He has seven alternating layers of curly and smooth beard in this image (Figure 1). Persians had the instruments and expertise to create these hair and beard styles, and also had special materials to make the styles permanent.

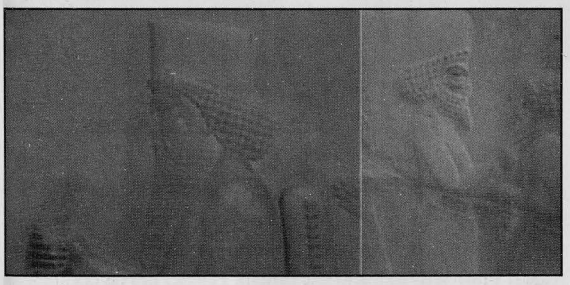

Figure 1. Darius the Great (left) and a Persian lord (right), 500 BC, Persepolis.

Another example is the portraits of kings on coins. For example, the two coins shown in Figure 2 dating back to the Parthian period are at Heidarzadeh Coin Museum in Yazd.

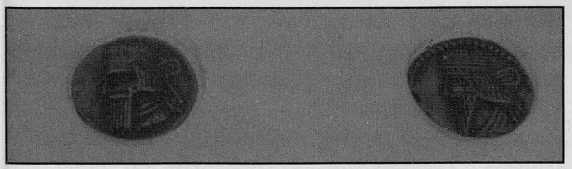

Figure 2. Parthian coins (247 B.C-224 AD), Heidarzadeh Coin Museum, Yazd.

The monumental statue of Shapour I (7 m high), the Sassanid emperor, also displays evidence of make-up art in Persia. This statue is located in Shapour Cave in Kazeroun (Figure 3).

Figure 3. Statue of Shapour, 242-272 AD, Shapour Cave, Kazeroun.

Statues of female figures also show important signs of cosmetic use in ancient Persia. The statue of an Ilamian lady dating back to 1000-1500 BC was found in Susa and is at Susa Museum (Figure 4). Another example is a statue dating back to 1500BC found in the Tourang Hill area (Golestan province) and displayed at the National Museum in Tehran (Figure 4).

Figure 4. Ilamian woman, 1000-1500 BC, Susa Museum, Susa (right), and stone statue, 1500 BC, National Museum, Teheran (left.)

A particularly striking example is Achaemenid princess with elaborately prepared eyebrows and hair portrayed in a statue from Susa at the National Museum in Tehran. Another beautiful statue from the Sassanid period in Susa Museum shows further evidence of hairstyling in ancient Persia (Figure 5).

Figure 5. Achaemenid princess, 500 BC, National Museum, Teheran (left), and Sassanid period statue, Susa Museum (right).Figure 5

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These examples document the importance of hair styling and make-up in ancient Persia. The instruments and materials needed for such elaborate cosmetic styling are discussed in the following sections.

1.2. Instruments to prepare and apply make-up

Instruments are needed to prepare and apply make-up, and their evolution can document the development of make-up in different civilisations. Archaeologists have discovered cosmetic instruments in different historical areas in Persia, and some of them are described below.

The Ilamian comb (3000 BC) shown in Figure 6 was found in Susa and is now at the historical museum in Gullrum, Gotland (Sweden). The comb and hair pin shown in Figure 6 date back to the Parthian period and are displayed at Reza Abbasi Museum.

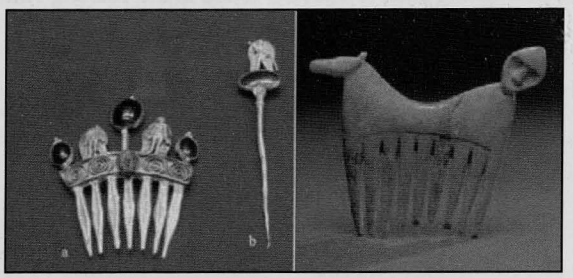

Figure 6: Ilamian comb, 3000 BC, Gullrum, Gotland historical museum (right), and comb (a) and hair pin (b), Parthian period, Reza Abbasi Museum, Tehran (left).

Other hair pins are shown in Figure 7. One of them from prehistoric times was found in the Cheraghali Hill area in Gilan province and is displayed at Rasht Museum. Others were found in Lorestan province, and are at the Decorative Tools Museum in Isfahan.

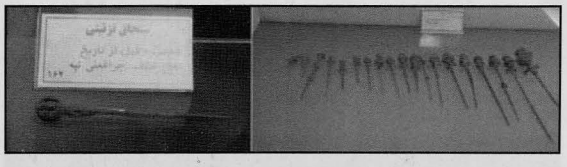

Figure 7. Hair pins, 1000 BC, Decorative Arts Museum, Isfahan (right), and hair pin, prehistoric period, Rasht Museum, Rasht (left).

Hair clips were also among the hair-styling instruments used in ancient Persia. One, found in the Toul area in Gilan province and dating back to 1st millennium BC, is shown in Figure 8 and is at the Rasht Museum.

Mirrors were another common accessory, and many types of them were used in ancient Persia. Figure 9 shows Mirrors found in the Aghoular area (Gilan province) and displayed at Rasht Museum. The pair of delicate silver tweezers shown in this figure is at the National Museum in Tehran, and is important evidence of the care and attention ancient Persians gave to their eyebrows.

Figure 8. Hair clips, 1st millennium BC, Rasht Museum.

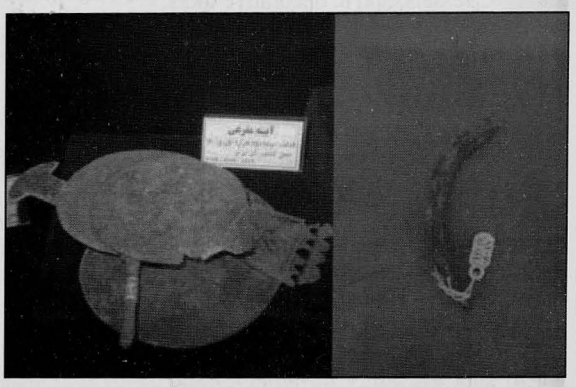

Figure 9. Persian gunmetal mirror, 1000 BC, Rasht Museum (left), and silver tweezers, 1000 BC, National Museum, Tehran (right).

The instruments described above, comprising just a few of the known ancient Persian make-up accessories, are strong evidence of the sophistication of cosmetic sciences in ancient Persia.

1.3. Make-up methods and materials

1.3.1. Hair waving and curling

People around the ancient world used different methods to curl and wave their hair. For example, in ancient Egypt (3000 BC) hair was waved by winding it around a stick, packing it in clay and letting the clay dry in the sun.[2] In Greek and Roman times, hair was waved with a heated iron rod.[3]

According to evidence from statues and other images, ancient Persians often waved and curled their hair. They probably used methods similar to those used by Egyptians, Greeks and Romans because of their close relationships with these civilisations in the ancient world.

1.3.2. Hair styling

Animal fats were the first materials used in hair styling by humans.[12] Persians probably used them, too, along with sugar solutions for styling and shaping.[13] Tragacanth (*Astragalus gummifera*) is one of the herbs used in hair styling. The *British Pharmacopoeia* defines tragacanth as the air-hardened gummy exudates, flowing naturally or obtained by incision, from the trunk and branches of *Astragalus gummifera* Labillardiere and certain other species of *Astragalus* grown in western Asia, especially

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Iran. The term 'Persian tragacanth' is used by pharmacists to denote the better grades of tragacanth produced in Iran (Persia). The main traditional sources of Persian tragacanth and the centres of collection are Isfahan, Shiraz, Kerman and Qasr-E-Shirin.[14] According to Saydana in the Aboureyhan Birouni manuscript, this herb cwas alled 'Zool Zadeh' by Persians.[15]

1.4. Shaving

Achaemenids didn't shave their beard as they believed the beard was the sign of manhood. But before and after this period, shaving prevailed in the Ilamian, Parthian and Sassanid periods in Persia.

1.4.1. Signs

Some statues show that Persians sometimes shaved their beards. One of them is the earthen Ilamian statue (1500 BC) found in Susa and displayed in Susa Museum. Another example is the statue of a Parthian lord shown at the National Museum in Teheran (Figure 10).

Figure 10. Ilamian portrait head, 1500 BC, Susa Museum (left), and Parthian lord, National Museum (right).

1.4.2. Shaving accessories

Cadavers preserved in salt, known today as the Salt Men, were found in a Chehrabad salt mine near Zanjan. They date from about 300 AD. A small packet found with the mummies contained an ear cleaner and shaver (Figure 11).

Figure 11. Shaver (left) with ear cleaner (right), 300 AD, National Museum.

1.5. Male wigs and toupées

In the *Cyropedia*, the Greek historian Xenophon noted that Astyages, the last king of the Medians used a wig.[16] Therefore, wigs were in use from the Median period.

2. Montmorillonite (shampoo)

Sedr (*Ziziphus spina-christi* (L.) Desf.) was mentioned in Bondahesh[17] and used as a shampoo in ancient Persia. Christ's thorn jujube, *Z. spina-christi* (Rhamnaceae) is a thorny bush that grows in southern Iran including the areas of Kazeroon, between Lar and Bandar Abbas in, Bam, and other areas. The powdered leaves, called konar or sedr, are used as a traditional shampoo.[18]

3. Peeling agents

White powder (sefid ab) is a traditional Persian peeling agent used in both ancient times and in contemporary Iran. The Shahdad exploration team found evidence (from 5000 years ago) of white powder made of lead or silver and very small bowls whose their bottoms and sides were painted with a red material identified as probably red powder, made of hematite stone in the Shahdad, Jiroft and Ive areas.[19]

4. Dyes and colours

4.1. Hair dyes

Pictures of Achaemenid soldiers on painted walls from the Susa Palace have yellow- and blue-coloured beards and hair (Figure 12). Persians are known to have used hair dyes in the Achaemenid Period. Some ancient Persian dyestuffs were mentioned in the Bondehesh, e.g., indigo (*Indigofera tinctoria*), madder (*Rubia tinctorium*), curcuma (*Curcuma longa*), karkam (*Crocus sativus*) and the dye derived from the as-yet unidentified plant known in ancient texts as dareparnian,[17] some of which were probably used as hair dyes. Henna (*Lawsonia inermis* L.) is another traditional hair dye in Iran.[20]

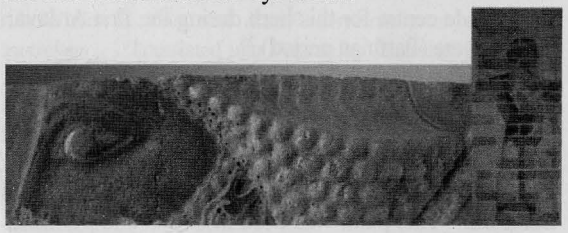

Figure 12. Achaemenid soldier, 550-330 BC, The Louvre, Paris.

4.2. Collyrium (Kohl)

Kohl is one of the most common traditional materials in Iran, and was used in ancient times as eye make-up and an eye tonic. Xenophon, in the *Cyropedia*, mentioned that Astyages used Kohl. Cyrus the Great also encouraged the use of kohl.[16]

Collyrium bottles made from coloured glass and bronze, the latter usually in the shape of a woman, have

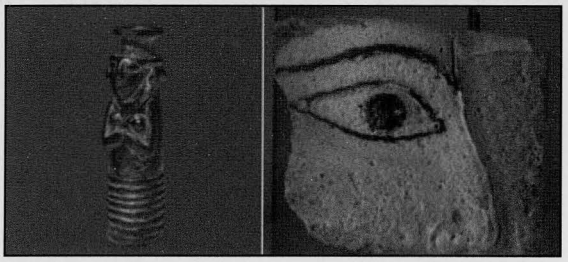

Figure 13. Kohl bottle, Achaemenid period, British Museum (left), and eye make-up on an Achaemenid soldier, Louvre (right).

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been found (Fig.13). Most of them measure 7 to 10cm in height.[21] Achaemenid soldiers also used collyrium, as shown in Figure 13.

4.3. Rouge

Xenophon mentioned that Cyrus the Great encouraged the use of face make-up.[16] Excavations in Shahdad, Jiroft and Ive found very small bowls dating from 3000 years ago with remains of a red substance on their bottoms and sides. The substance, probably a red powder, is made of hematite stone.[19] Red powder is a traditional Persian cheek colouring.

5. Perfumes

Perfumes and air fresheners were very important materials in ancient Persia. Perfumes were used specially by lords and kings, some of whom had special procedures and protocols for using perfumes.[22]

5.1. Aromatic herbs used in perfumes

Aromatic herbs were one of the main sources of perfumes, and were also used as air fresheners. Aromatic herbs were one of the 11 groups of herbs known and used in ancient Persia.[17] Some herbs from this group are discussed below.

Frankincense (*Boswellia carterii*, Avestan name: *vahugaonā*, Pahlavic name: *hugun*) was a herbal perfume[23], used when a person died at home or in an enclosed area.[24] The western shore of the Persian Gulf was a trade centre for this herb during the first Ardavan kingdom era (Parthian period).[25]

Elecampane (*Inula helenium*, Avestan name: *urvāsna*, Pahlavic name: *rāsan*) was another perfume herb.[23] This plant is widespread throughout Europe and southwest Asia, and in Iran it is widespread the provinces of Azerbaijan, Kordestan, Hamedan, Markazi and Lorestan.[26] This plant was used in scents and perfumes such as frankincense.[24]

Sandal (*Santalum album*, Pahlavic name: *čandal*) was used as a perfume and an antiseptic.[23]

Other aromatic herbs in common use were camphor (*Cinnamomum camphora*, Pahlavic name: *kāfur*), pomegranate wood (*Punica granatum,* Avestan name: *hāδāneāptā*, Pahlavic name: *hāδāmpak*), iris (*Iris* spp., Avestan name: *mabāk*, Pahlavic name: *čambak*), violet flower (*Viola odorata,* Avestan name: *vanpašak*, Pahlavic name: vanafšak), badangboy (Avestan name: vātrang, Pahlavic name: vātrangbōy), sweet basil (Avestan name: sparyam, Pahlavic name: šāhsparham) and *palang mošk* (pahlavic name).[17, 23, 24]

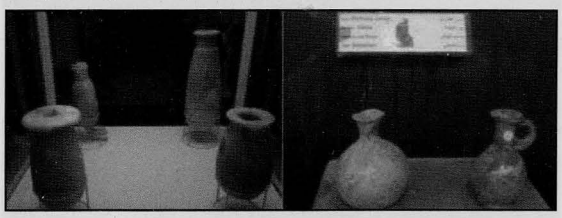

Figure 14. Marble scent bottles, Achaemenid period, Persepolis (left), and glass scent bottles, Sassanid period, Susa Museum (right).

5.2. Scent bottles

Many scent bottles of different sizes and materials have been found in Iran. Figure 14 shows large marble scent bottles from the Achaemenid period, found in Persepolis. Also shown are two glass scent bottles from the Sassanid period, found in Susa.

6. Oils

Oils, applied to the skin to protect and moisturise it, remain one of the main ingredients in cosmetics today.

6.1. Evidence

Oils were used after bathing as shown by a stone figure in Persepolis depicting a man with a jar of oil in one hand and a towel in the other (Figure 15). An oil jar found in Susa and displayed at the British Museum is similar.

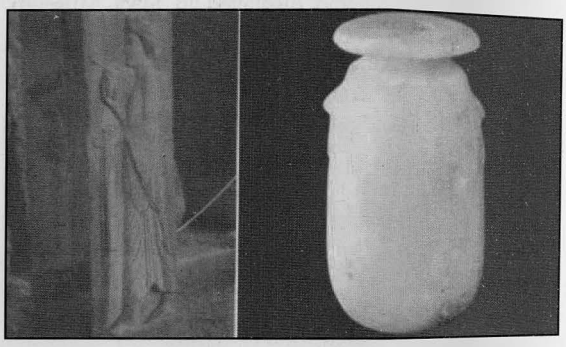

Figure 15. Man with an oil jar in his hand, 500 BC, Persepolis (left), and oil jar (cat. Num. 278), Achaemenid Period, British Museum (right).

6.2. Essential oils of plant origin

Oily herbs were one of the 11 groups of herbs used in ancient Persia. Among the most commonly-used plants were castor (*Ricinus communis*), hemp (*Cannabis sativa*) and olive (*Olea europaea*).[17] Hemp was called *tokhm-e-kanab*, and olive was called *zit* and its oil was called *āb-e-zit* by Persians.[15]

7. Vessels to prepare and store cosmetics

Mortars and pestles were one of the most important types of vessels in pharmaceutics. They were used for making both medicines and cosmetics. They differed in size and material depending on their usage. Three such vessels are shown in Figure 16, and other cosmetics vessels are shown in Figure 17. The small mixing trough in the left-hand panel was probably used to prepare hair dye.

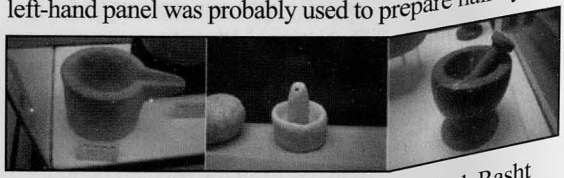

Figure 16. Stone mortar, prehistoric period, Rasht Museum (left), stone mortar, Ilamian period (1000-1500 BC), Susa Museum (centre), and green stone mortar, Achamenid period, Persepolis Museum (right).

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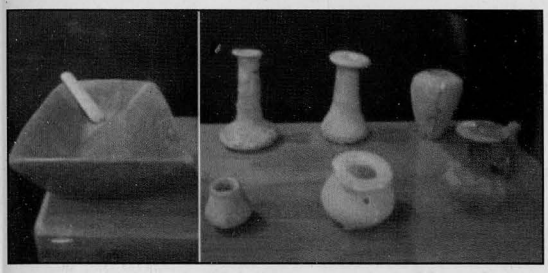

Figure 17. Cosmetic vessels, Achaemenid period, Susa Museum.

8. Decorative accessories

Decorative tools were widespread in ancient Persia. Figure 18 shows examples of a necklace, armlets, earrings and girdle clasp. These are just some examples of the numerous types of decorative accessories found to date.

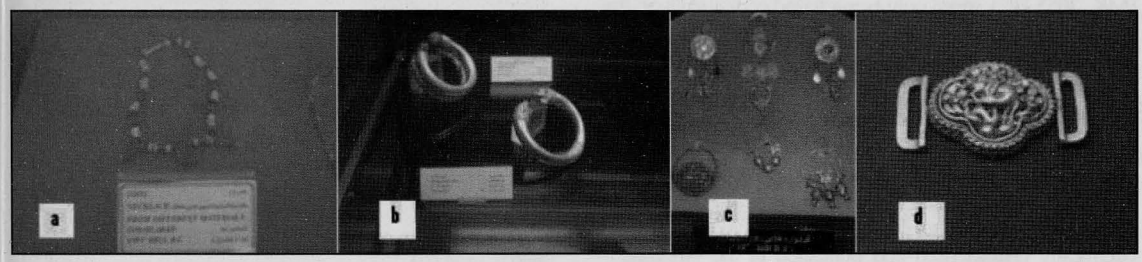

Figure 18. From left to right: a) Necklace, 5th millennium BC, National Museum; b) Gold arm bracelet, Achaemenid period, Reza Abbasi Museum, Tehran; c) Earrings, Achaemenid period, Tabriz Museum; d) Golden girdle clasp, Sassanid period (5-6th century AD), Reza Abbasi Museum, Tehran.

Conclusion

Although most evidence from ancient Persia about cosmetic sciences has been lost, insights into its main features can be obtained from an analysis of the remaining evidence in the context of archaeological findings and written evidence. This can help us to clarify the details of cosmetic sciences from ancient Persia as part of the world's pharmaceutical history. Obviously, further clarification will require additional detailed research. It is hoped that future studies will shed light on the history and evolution of pharmacy in ancient Persia and also the world.

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Brown cosmetics in ancient Egypt

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The colour brown[1], when used for eye cosmetics (kohl; also, kuhl, kohhel, kohol and cohol) in ancient Egypt, was not common. Green was the colour used predominantly in the pre-dynastic period (5500 to c. 3100 BC)[2]. Black kohl was occasionally found in this period, and its usage became increasingly common over time. *Both* colours were sometimes found together as funerary offerings from the 1st to 10th dynasties (c. 3100 to c. 2025 BC).[3] Black alone was increasingly found from the start of the Middle Kingdom (MK, 2055 BC), green only being found occasionally in the New Kingdom (NK, started 1550 BC) and with its last *known* occurrence being in the 19th dynasty (1295 to 1186 BC).[4]

Malachite [$CuCO_3.Cu(OH)_2$, a basic copper carbonate] has nearly always been found to be the main component of the green eye cosmetics. It is assumed that the malachite was obtained from the many easily accessible copper ore deposits in Sinai and the eastern desert.[5] However, it should be mentioned that only seven such samples have been fully chemically characterised and published in the literature.[4,6] Many more 'black' (this includes grey-black, steel-grey and grey) kohl samples have been chemically characterised and published. If we include the seven so-coloured samples very recently published by ourselves,[7] then 102 (78%) of the 131 ancient Egyptian kohls samples analysed to date are 'black'. Galena (lead sulphide, PbS) is the most common major component of these 102 kohls; followed in decreasing order by pyrolusite (manganese dioxide, MnO_2), magnetite (an iron oxide, Fe_3O_4), tenorite (a copper oxide, CuO) and stibnite (antimony sulphide, Sb_2S_3).[4,7,8,9,10] All of these minerals, except stibnite, were available within their own borders.[4] The stibnite was probably imported from Arabia via Punt (currently thought to be Eritrea, Somalia or even Yemen). The galena mostly came from the various lead mines of the eastern desert and down its Red sea coast, and by the 12th dynasty (1985 to 1795 BC) almost all of it was coming from the Gebel el Zeit mine (approx. 27.9° N 33.5° E).[9]

The only other colours found for these 131 cosmetics[7] were brown and white (which includes grey-white). The latter colour was, until a decade ago, thought to arise only from the presence of the lead ore cerussite (lead carbonate, $PbCO_3$) as the main component.[4] However, in 1999 the first of several articles was published showing that the ancient Egyptians, from c. 2000 to 1200 BC at least, manufactured the (white) lead chlorides laurionite [Pb(OH)Cl] and phosgenite [$Pb_2(CO_3)Cl_2$].[11] These 'made' lead compounds were usually added to (black) galena to give 'shades of grey' eye/face cosmetics; and, it is currently thought, for a medicinal use. Very recent work has shown that this (perceived) medicinal usage has a basis in fact and that their presence may well have reduced/prevented bacterial infections via the eye.[12] Perhaps the ancient world's first *working* cosmeceutical?

This just leaves the brown coloured kohls of ancient Egypt. Almost ten percent (i.e. 7 of 74) of the kohl samples analysed by 'wet chemistry' are stated to have 'brown ochre' (6 samples) or 'limonite' (1 sample) as their major components. The limonite sample was found at Armant and was of pre-dynastic date, whilst for five of the six brown ochre samples one was from Kahun (also, Lahun) and dated to the 20th dynasty (1186-1069 BC), whilst the other four were from Gurob and dated to the 19th dynasty.[4] Details of the sixth sample could not be ascertained. Their exact colours are uncertain, but are assumed to be brown as defined in this article.[1] We can find no published record to date of any other such coloured samples from ancient Egypt being chemically analysed. Also, the words 'brown ochre' and 'limonite' can have a range of (chemical) meanings. The latter word is now a general term used to describe a naturally occurring mixture of iron oxides and hydroxides; whilst the former phrase is used for a naturally occurring hydrated iron oxide ($Fe_2O_3.nH2O$). Variously coloured iron ores did occur, and were mined, in ancient Egypt; in the eastern desert's limestone (e.g. Bahariya, SE of Cairo) and in the Nubian sandstone of southern Egypt (e.g. several sites NE of Aswan).[13] Ochre (*sety*) is listed as being used in their eye medicine recipes, and is thought to refer to a mixture of clay and (hydrated) iron oxide.[14]

New samples

We have recently analysed twelve kohl samples from the Egypt collection of The Manchester Museum, University of Manchester (UK). Three of these samples were varying shades of brown in colour. These samples were chemically characterised using three analytical techniques. Quantitative elemental composition was given by the technique of Low Vacuum Scanning Electron Microscopy (LVSEM), and semi-quantitative identification of the crystalline compounds present by the X-Ray Powder Diffraction (XRPD) technique. The third technique used was Quantitative Evaluation of Minerals using Scanning Electron Microscopy (QEMSCAN), which gave quantitative identification of the minerals/inorganic compounds present (crystalline *or* amorphous).[6,8]

The museum's accession number (of the container) is used to identify each sample. Also given is the site where each container (i.e. kohl pot/shell) was found and its assigned date. Pictures of the two kohl pots are shown (Figures 1 and 3), plus the bivalve shell and its contents (Figure 2, at the end of the inserted arrow). Also shown is a typical NK kohl pot (Figure 4). The analytical results for each sample are given in the following way: first the LVSEM results (in decreasing order of elemental weight percent, with the elements in brackets being at less than 1% each), then the combined results of QEMSCAN and XRPD. The former technique, whilst it does give quantitative weight percents, does sometimes only identify a group of inorganic compounds. The latter technique can identify the *actual* inorganic compound present from this group, provided it is crystalline and present at a percentage above the equipment's relevant resolution limit. Thus we have listed, for each sample, the QEMSCAN results with their percentages and with the XRPD results, if available, given in

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brackets (in decreasing order of their approx. percentages) after any group listed. The detection limit for our XRPD equipment is taken to be 3% for these samples, and so all inorganic compounds found (by QEMSCAN) at below this value are only qualitatively summarised.

Results

Sample 7055 (Figure 1)

This pot was found at Qaw el-Kebir/Qau and was dated to the 3rd dynasty (2686-2613 BC). The pot was said to be, in the museum's database, made of limestone. However, we feel that it may be made of a serpentinite (a group of magnesium silicate minerals). The kohl powder sample had a light brown colour.

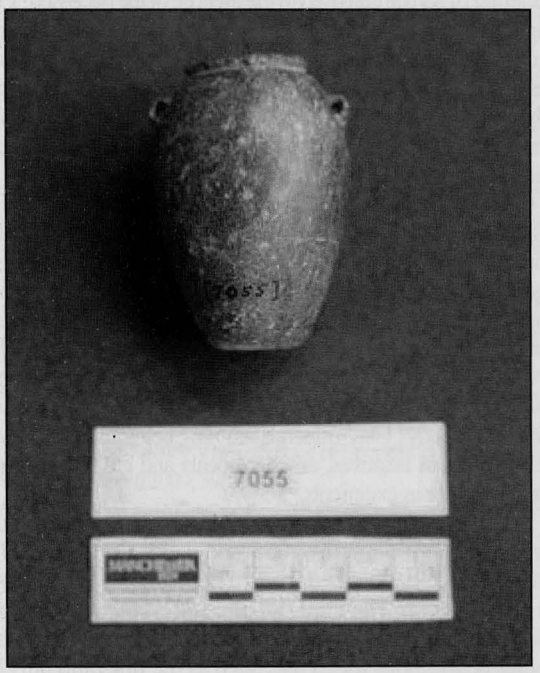

Figure 1. Kohl pot, accession number 7055 (3rd Dynasty)
(© The Manchester Museum, University of Manchester, UK)

LVSEM: O, C, Si, Ca, Al, Fe, Mg (Na, S, K).

QEMSCAN (XRPD): quartz (SiO_2) 65.65%; calcite ($CaCO_3$) 10.8%; plagio-feldspars (variable formulae silicates) 8.2%; K-feldspars (potassium silicates) 4.2%; aluminium silicates 4.1%; with the remainder consisting of calcium silicate(s), iron-aluminium-magnesium silicate(s) (such as Fe-Mg-montmorillonite), muscovite ($H_2KAl_3Si_3O_{12}$), titanium mineral(s), magnesium silicate(s) (such as a serpentinite), biotite ($H_4K_2Mg_6Al_2Si_6O_{24}$) and calcium sulphate(s).

Sample 1642 (Figure 2)

This sample consisted of loose small near-rectangular lumps [each being approx. 0.5 (W) x 1.0 (L) x 0.5 (D) cm] in a bivalve shell. It was from Diospolis Parva/Hu/Hiw and was dated to the 12th dynasty. The individual lumps were black in colour, but gave a brown powder on crushing.

LVSEM: O, Si, C, Fe, Al, Mg, K, Ca, Na (Ti, S).

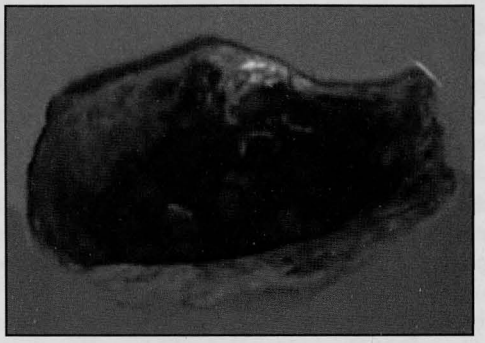

Figure 2. Shell container, accession number 1642 (12th Dynasty)
(© The Manchester Museum, University of Manchester, UK)

QEMSCAN (XRPD): aluminium silicates 38.2% (the clay minerals rectorite, montmorillonite, illite and kaolinite in approx. ratios of 5:4:2:1); plagio-feldspars 14.9% (labradorite, bytownite and possibly anorthite); iron-aluminium-magnesium silicate(s) 14.6% (very likely a clay mineral with iron and magnesium present – such as Fe-Mg-montmorillonite); quartz 9.7%; K-feldspar(s) 6.3% (orthoclase); calcium silicates 4.5%; muscovite 4.1%; with the remainder consisting of titanium mineral(s), biotite, magnesium silicate(s) and calcium sulphate(s).

Sample 1415 (Figure 3)

This pot was found at Gurob and dated to the 18th dynasty (1550-1295 BC). The pot was said to be, in the museum's database, made of serpentine (a serpentinite mineral). The kohl sample powder had a light brown colour.

LVSEM: O, C, Ca, Si, Al, Fe, Na (Mg, S, K, Cl, Ti).

QEMSCAN (XRPD): plagio-feldspars 60.8% (labradorite, bytownite and possibly anorthite); aluminium silicates 15.1% (the clay minerals rectorite and

Figure 3. Kohl pot, accession number 1415 (18th Dynasty)
(© The Manchester Museum, University of Manchester, UK)

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montmorillonite); calcite 9.7%; and the remainder consisting of calcium silicate(s), quartz, calcium sulphate(s), iron-aluminium-magnesium silicate(s) (such as Fe-Mg-montmorillonite), muscovite, titanium mineral(s), K-feldspar(s), magnesium silicate(s) (such as a serpentinite) and biotite.

Discussion and conclusions

The pots used for samples 7055 and 1415 (Figures 1 and 3 respectively) are larger and of different styles and shapes to the more 'typical' kohl pot (e.g. see Figure 4). Were they perhaps communal/group/family kohl containers? Using a readily available (brown) local material as an alternative to the more usual 'black eye paint'? Unfortunately we do not know the exact provenance (i.e. no excavation reports) for the two pots, but we have assumed that their contents are indeed kohl

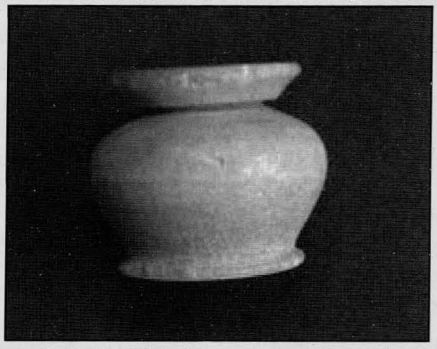

Figure 4. Typical (NK) kohl pot (accession number 3956) (© The Manchester Museum, University of Manchester, UK)

and not erosion/corrosion/contamination material. Both of the samples have silicon-based compounds as their major components. Their colours are thought to be the result of small amounts of an iron oxide/oxyhydroxide [possibly ferrihydrite, one formula being $Fe_5O_3(OH)_9$] being absorbed on to the surface of a clay mineral present, such as montmorillonite.[15] Previously studied 'brown ochre' kohl samples[4] have all been based on iron oxides, with these major components giving the samples their colours.

None of the major, or minor, components of both samples are particularly toxic. The silicon-based compounds, when ingested (rather than inhaled as dust particles, which could give rise to respiratory problems) in small amounts would have had little if any toxic effects. The word 'ochre' usually, now, has a descriptive prefix word present; such as brown, yellow or red. In ancient Egypt the same word, *sety*, has been translated as (brown?) 'ochre' and as 'yellow ochre'; and, as mentioned previously, is thought to refer to a mixture of clay and (hydrated) iron oxide. There is also 'red ochre' (*menshet*, though several other words are sometimes given) and 'ochreous earth' (*senet*, and/or perhaps *kesenety*).[16] In several of their medical recipes, for example: coughing, eye diseases and 'to put the urine in order', 'ochre' is mentioned.[14]

Sample 1642, of small man-made lumps in a shell, is both more interesting and more complicated. The museum's database states that this sample is galena and that it was used as kohl. It is definitely *not* galena, and possibly *not* a cosmetic. Given its chemical composition, this sample is in our opinion very probably (local) Nile mud/sediment (*qah*)[14]. Its colour is probably given, as for the other two samples studied here, by the absorption of an iron oxide on to the surface of a clay mineral such as montmorillonite. The ratios of the clay minerals found in our sample are in general agreement with those found for Nile river sediment, past and present, from regions of the Nile that are close to the area of what was once Hiw.[17] The possible uses, in life and/or the after-life, for these mini-'bricks'/'biscuits' are: a food supplement (an ancient Egyptian version of geophagy?); medicines (upset stomachs and for skin rashes/burns); cosmetic (face rather than eye?); detoxification of an ingested poison (even in the after-life?); or as a brown *paint* pigment when crushed and mixed with water?[14,18,19,20,21] Or, perhaps, it represented a funerary offering of something used in the lifetime of the deceased? Or, again, using Occam's razor, perhaps it was simply a funerary offering to Geb, the God of the fertile soil of ancient Egypt and especially of Nile mud? We can find no specific mention of this artifact in the (1901) excavation report,[22] nor have we managed to find mention of such an artifact in the published literature on ancient Egypt.

Its toxicology would normally be expected to be low. Silicon *is* a required trace element, being essential for normal bone growth and for proper integrity of the skin. However, geophagy *can* lead to health problems from exposure to soil pathogens/harmful elements in the material ingested (here mud/sediment). Also, the words of Paracelsus (1493-1541 AD) are still valid: 'all substances are poisons; there is none which is not a poison; the right dose differentiates a poison from a remedy.' Clay minerals are *now* being used as active ingredients in laxatives, antidiarrhoeals and gastro-intestinal protectors, or as excipients.[23]

Thus our three brown samples are silicon-based, but iron-coloured. Samples 7055 and 1415 were probably used as locally obtained 'brown ochre' kohl, perhaps by a family group. The third sample, 1642, *could* have been used as a brown cosmetic. However, there are several other possibilities for its use, such as the first (and only?) detoxification of the after-life.

The artifacts of history have varying amounts of information attached to them. The 'where' (found) and the 'when' (date of manufacture/burial) are often known, but only sometimes the 'whom' (the previous owner or the one given it for the after-life). The 'what', here, is the chemical composition of the samples and the 'how' covers their constituents' origins in nature or the processes used by man to make them. This leaves the 'why'; and often there is only limited written information available. So, we imagine the 'why', so that we or others can 'see a little further'.

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The Proposal for an Imperial Pharmaceutical Qualification 1929

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The idea of a British imperial qualification for pharmacy was considered at length at the British Pharmaceutical Conference held in Dublin in 1929.[1] It followed a proposal, made at the Tenth General Assembly of the League of Nations held that year in Geneva, that member states should consider the feasibility of developing qualifications that would be internationally recognised. The hope was that such an initiative would facilitate the freedom of movement of individuals between countries, and establish minimum levels of training in certain occupations in member states.[2]

Origins in the League of Nations

The early years of the League of Nations were difficult ones, but in 1924 it was given a boost when two leading British politicians (James Ramsay MacDonald and Arthur Henderson) and one from France (Edouard Herriot) visited Geneva. Hugh Dalton, one of the delegation, wrote enthusiastically that 'the League seemed to have come to life again, and to have gained a new significance'.[3] Five years later, in 1929, foreign ministers of all the main European nations attended meetings of the League. Mary Hamilton, a Labour Party delegate to the Assembly, later wrote: 'Geneva in 1929 and 1930 was a genuine international clearing-house of ideas... There was hard work, and there was goodwill'.[4] It was at this tenth assembly that Aristide Briand first presented his plan for a United States of Europe.

It was from this 'international clearing-house of ideas' that the proposal for international qualifications emerged. There had been earlier attempts to promote some kind of international organisation for education, on the lines of the International Labour Organisation, but the official reaction was that education was too much a matter for national sovereignty to permit international regulation. An International Bureau of Education was however established in 1925, later becoming part of UNESCO.[5] A move to standardise occupational qualifications was an obvious next step.

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The governments of member states referred the matter to the representative bodies of the various occupational groups in their countries for consideration; for pharmacy in Britain, it was referred to the Pharmaceutical Society of Great Britain. The Council considered it carefully, and decided that the appropriate forum was a meeting of branch delegates at the British Pharmaceutical Conference. It referred the matter to the Conference Organising Committee for action.

Pharmacy education in Britain and colonies

The discussion took place against a background of little consensus of what should be required for registration as a pharmacist. In the early part of the twentieth century pharmacy education even in Britain was still highly variable. Although the two-tier examination system (the Minor examination leading to the chemist and druggist qualification, and the Major examination leading to the pharmaceutical chemist qualification) was firmly established, there was a multiplicity of courses in pharmacy that varied in standard of coverage, teaching and facilities.[6]

It was only in 1918 that the principle of a compulsory course of study was adopted. Although the University of Manchester introduced a BSc degree for pharmacy students in 1904, and the University of Glasgow introduced one in 1907, neither of these was recognised for the purpose of qualification by the Society. Only when the bachelor of pharmacy degree was introduced by the University of London in 1924 was approval given for registration as a pharmaceutical chemist, and even then this was subject to a test in forensic pharmacy.[7] In 1929 the vast majority of pharmacists in Britain still followed an apprenticeship leading to the basic chemist and druggist qualification.

Across the British Empire a wide range of different arrangements had become established. Pharmacy education in Australia was largely based on the British model, of apprenticeship accompanied by college attendance, although there were substantial differences between arrangements in the various states.[8] In South Africa an informal school of pharmacy had been established only in 1885, in Cape Town.[9] Formal pharmacy classes were not inaugurated in Durban, in Natal, until 1908.[10] In India formalised pharmaceutical instruction had begun in 1860, when pharmacy classes started at the Madras Medical College, but the numbers qualifying as dispensers were tiny.[11]

In Canada pharmacy education had advanced at very different rates in the various provinces. The earliest initiatives were taken in Montreal, Quebec, in 1879.[12] The Ontario College of Pharmacy, established in 1871, set about establishing educational standards and organising training facilities, which opened in 1882.[13] In Manitoba the Pharmaceutical Association made arrangements for the instruction of students in 1888.[14] But in Alberta steps were taken to establish a course in pharmacy only in 1912.[15] By the turn of the twentieth century some of these provinces and countries considered their own qualifications to be comparable with those of Britain, and sought to have them recognised by Britain through the mutual recognition of pharmaceutical qualifications.[16]

Discussion of the proposal

The person asked to take forward discussion of the issue of an international pharmaceutical qualification on behalf of the Council was Herbert Skinner, the immediate past president of the Pharmaceutical Society (Skinner was president 1927 to 1929.) He was also a member of the Organising Committee for the 1929 British Pharmaceutical Conference, and therefore in a good position to shape its programme. Considerable discussion took place within the Committee as to how the topic should be handled at the conference. Rather than tackle the challenge of considering an international qualification for pharmacy they opted for a rather more limited approach, restricting the initial discussion to a standard qualification in pharmacy for the Commonwealth.

The issue became the major item for discussion at the Dublin Conference. A meeting of branch delegates was held in the Mansion House on Wednesday morning, June 26, 1929.[17] It was chaired by the current president of the Pharmaceutical Society, Mr L Morton Parry (president 1929 to 1930) thanked those present for attending in such large numbers, which 'showed that as pharmacists, delegates of branches throughout the country, they realised that even in a conference like this, which is more or less of a social nature, there were responsible duties to the branches, the Society and to themselves.' He then called upon his 'old chief, colleague and friend, Mr Herbert Skinner, to give a paper on 'Is an imperial qualification desirable?'

Skinner outlined the task before them. The object of the exercise, he declared, was 'to inquire whether it is possible, apart from the desire, to construct out of the materials available, a qualification in pharmacy that might be interchangeable within our Commonwealth of Nations.' He reminded delegates of the origin of the request. 'At the present moment we have, from the League of Nations, the suggestion that we might consider building up an international qualification, and your Organisation Committee felt that we might consider it from that point of view as well.'

These twin objectives (to create a mechanism for interchange within the Commonwealth, and to establish an international qualification for pharmacy) had earlier been considered at length by the Society's Council. Skinner explained the position that the Society had reached prior to the Conference. 'The situation is not sufficiently developed,' he observed, 'to consider at the present moment whether an international qualification is possible that would meet the sanction of the League of Nations sitting at Geneva. As far as we are concerned, we need to concentrate almost entirely at the present moment on the position within our own Commonwealth of Nations.'[18]

Pharmacy education in the dominions

What followed was a detailed analysis of the state of pharmaceutical education in a number of Commonwealth countries, most notably the dominions of Canada, Australia, New Zealand and South Africa. Interestingly, there was no mention of India, although reference was made to the position in Wales and Northern Ireland.

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Skinner began his investigation with a review of the situation in Canada. 'We find in Canada reciprocity between Great Britain and the Province of Ontario. In the calendar of this Province we find a system of studies laid down, a curriculum for apprentices during three years in a shop, more as suggestions for training than as hard and fast regulations. We find a later series of studies in some respects surpassing our own. If we visit their examinations and study the whole position from what they have in their syllabus,' he concluded, 'we should say it is very fine indeed.'[19]

Yet despite such praise Skinner was unable to concede that the training in Ontario was equal to that in Britain. 'As far as that is concerned', he continued, 'it is still, in my opinion, behind our own. For this reason training in Great Britain has become the crux of the situation, not dependant upon specified text-books, but upon well-thought out and planned curricula producing organised training.' Such an attitude was hardly likely to be well received in the colonies and dominions.

But there were other problems besides simply the structure of the training. There was considerable variation even between the different states and provinces within the various countries. Skinner pointed out that 'in the whole of Canada we have only reciprocal arrangements with Ontario.' He then briefly described arrangements in the other provinces: 'In Nova Scotia [pharmacists] may register on sufficient evidence of qualification; Manitoba follows the same lines with the addition of passing any examination as the Council may prescribe. In Prince Edward Island the province may accept the diploma of any other examining body on sufficient evidence of qualification; while Alberta has special provisions governing acceptance of specific diplomas.'[20]

Skinner went on to review the position in South Africa. 'The requirements for training in the South African Union are similar to our own,' he declared. 'They have largely built on British work, and the result is that, though their training may be insufficient at present, undoubtedly the position will develop.' South Africa was busy building up its capacity to train its own pharmacists, and wished to limit immigration from Britain and elsewhere. 'We cannot blame them for wishing to take no more graduates from this country, or any country, until they have built up confidence in their own resources'. He noted that South Africa was 'in no hurry for reciprocity with England, as they are of the opinion that the supply of the South African product is equal to the demand.'

In describing the position in Australasia, Skinner noted that Britain had reciprocal agreements with all parts of Australia, Tasmania and New Zealand. 'The conditions there were fixed some years ago, and work satisfactorily,' he observed. In Northern Ireland, he noted, 'they were concerned largely with the question of reciprocity, and the question of an imperial qualification is not devoid of interest. We shall have reciprocity with them now because we managed to get it through in the last hours of the late Parliament.'[21]

One of the big differences between countries, even within the British Isles, was in the entrance qualifications for pharmacy training, the so-called matriculation standard. Mr GR Knox Mawer, a delegate from Wrexham, observed that 'in Wales the matriculation certificate can be obtained without mathematics, which is a most vital subject in pharmacy. In the secondary schools in North Wales there were difficulties in taking Latin with physics and chemistry.'

Next steps in implementation

With such great diversity in pharmacy training and qualifications it is easy to see why pharmacy leaders were hesitant to move forward with the proposal for an imperial qualification. Skinner's proposal to the Conference was that the first step should be for Britain to review its own arrangements for the training of pharmacists. He declared: 'now, I must confess that, though I want to say an imperial qualification is desirable, I am bound to admit from the experience I have gained in Great Britain, from Northern Ireland, from the [Irish] Free State, also from Canada and from an examination of the South African papers, that the present moment is one for Great Britain to re-examine its own syllabus, its own system of training, set that in order, and present an example to the others who, in my opinion, would willingly follow.'[22]

There were, nevertheless, more concrete proposals suggested from the floor. Dr E G Bryant, a delegate from Aberdeen, reported that his 'students from Aberdeen were in every part of the Empire at present, and they have had considerable difficulty in many cases in getting recognition of their qualifications abroad.' He suggested that an Imperial Pharmaceutical Conference be convened, noting that such conferences had been convened before in other spheres. He declared that 'the difficulties were known to him', but it did not seem to him that such a conference was beyond the Society's powers.

In his response to the many comments made, Skinner noted that in 1932 there would be a meeting of the American Pharmaceutical Association, hosted by the Canadian Society in Toronto. He noted that invitations would be sent to the British, Australasian and South African Societies to send delegates. 'If the situation is so developed, and the atmosphere is created, probably it would be a good thing to have a paper something on these lines' [i.e. an imperial pharmaceutical qualification].[23]

So the response of the Society was to postpone any further discussion of the issue to a future date. Skinner noted; 'to call one earlier I think would be a waste of time, because the situation has to develop. You must not rush these things. You must create the atmosphere that is going to make the thing possible, and the various societies, including that of the Free State here [in Ireland], will be able to join in a discussion.'

Whether the issue was ever discussed at the meeting of the American Pharmaceutical Association in Toronto is unclear, but there is no further mention of an imperial qualification in the Pharmaceutical Journal. Skinner does not seem to have taken the idea forward, despite claiming in Belfast later the same year that 'my ambition was not merely for our Empire, but I would like to include the English-speaking race, but that perhaps is only a dream.'

Response to the plan in the colonies

Reports of the conference discussions quickly reached the far reaches of the empire, courtesy of the pages of the *Pharmaceutical Journal*. The response was generally muted,

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not least because the only firm proposals agreed were to discuss it again at the 1932 American Pharmaceutical Association meeting to be held in Canada. Pharmacists in Australia, New Zealand, Canada, and South Africa had other things to worry about, and there is no evidence from the records that any of them considered the idea of an international, or even a Commonwealth, qualification at any length. Yet all these countries were themselves members of the League of Nations and hence mandated to consider the development of an international qualification.[24]

The fact that Skinner made no mention of the situation in India in his address reflects the fact that the British had largely ignored the development of pharmacy education in India.[25] Nevertheless, developments in pharmacy education in Britain were followed with great interest in India. A number of distinguished Indians travelled to Britain to see developments for themselves. Sir Prafulla Chandra Ray, for example, visited a number of schools of pharmacy in England in 1921. He was particularly impressed with what he saw at the Society's School of Pharmacy in Bloomsbury Square.[26] He liked the way in which the British pharmacists were trained, and regretted that no such facilities were available for aspiring pharmacists in India. He proposed the establishment of schools of statutory pharmaceutical qualification in India.[27] The training programme for compounders in Bengal was improved in 1928.

Another leading Indian figure, Jyotish Chandra Ghosh, who had graduated from the University of Manchester in 1912 and worked as a pharmaceutical chemist at the Government of India Medical Store,[28] stated that, without a systematic pharmaceutical education, it was impossible either to produce the drugs of the quality required in order to be of therapeutic value, or to provide the desired machinery for enforcing legislative control of the sale, manufacture, analysis, and dispensing of drugs.[29] Ghosh considered that the idea of a British imperial qualification in pharmacy was premature, when in a country like India there was the absence even of a legislation for the control of pharmacy. This only came only after independence from Britain with the Pharmacy Act of 1948.[30]

Conclusion

In the end it was world events more than anything that put paid to progress in developing an imperial pharmaceutical qualification. On 4 September 1929, just two months after the Dublin conference, a dramatic fall in stock prices occurred in the United States. This rapidly spread around the world, leading to the stock market crash on 29 October 1929, which heralded in the Great Depression. Although some economies started to recover by the mid-1930s, in many countries the negative effects of the Great Depression lasted until the start of the Second World War. The idea of an imperial pharmaceutical qualification was quietly shelved.

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Anticipating sympathomimetic asthma therapy: Henry Hyde Salter (1823–1871)

Axel Helmstädter
University of Marburg, Germany

Besides glucocorticosteroids, beta-sympathomimetics have doubtless been one of the pillars of asthma therapy since their development in the 1960s. This drug class is an example of early rational drug design since most compounds were discovered by a systematic chemical variation of isoproterenol as lead structure.[1] This development followed the differentiation of sympathetic receptors achieved in principle by Raymond Perry Ahlquist (1914–1983) who, in a landmark publication of 1948, came to the conclusion:

> There are two distinct types of adrenotropic receptors as determinded by their relative resonsiveness to the series of racemic sympathomimetic amines most closely related to epinephrine.[2]

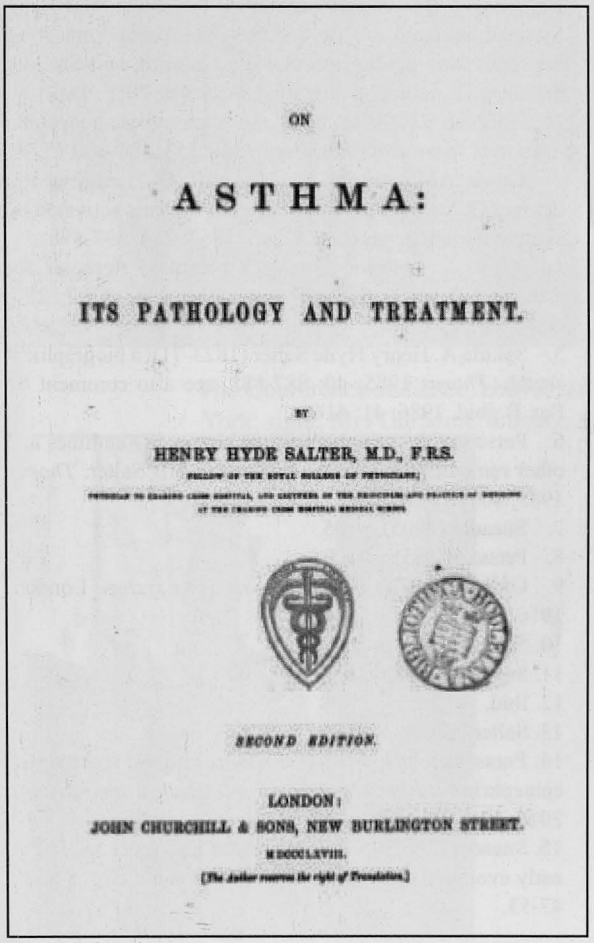
In 1967, AM Lands further distinguished $beta_1$ from $beta_2$ receptors and thus laid the theoretical basis for the development of drugs like $beta_2$-sympathomimetics and, on the other hand, cardio-selective beta-adrenoceptor antagonists.[3] In Britain, salbutamol, which was introduced as a metered-dose inhaler under the trade mark Ventolin in 1968, has been dominating the beta-mimetic market for more than 40 years now:

> […] since its launch, the name Ventolin has become to asthma what Hoover is to housework.[4]

However, asthma treatment by stimulation of the sympathetic nervous system, i.e. adrenergic receptors, has a much longer history.

In 1860, the British physician Henry Hyde Salter summarised the state of the art treatment in a comprehensive book entitled *On Asthma: Its Pathology and Treatment*, which was re-edited in an extended version in 1868. This publication, which was regarded 'the best book on asthma to appear during the nineteenth century',[5] mentions treatment options which can be, from our point of view, related to sympathomimetic (or parasympatholytic) treatment. Its author, Henry Hyde Salter, was born November 2, 1823 in Poole, Dorset, and graduated MD from Kings College in 1851.[5] In 1854 he moved to Charing Cross as a lecturer in physiology and physician. He later became a member of the school of medicine's management there and acted as dean of the school in the years 1867 and 1868. It is believed that Salter suffered from asthma himself which probably had developed out of a whooping cough episode during childhood. Having been more or less symptom free for years, he started to suffer from severe asthma symptoms again at the age of 44. In 1871 he developed a lung abscess and eventually died the same year at the age of 48.

His book *On asthma* is worth reading with today's eyes. It gives a fairly comprehensive overview about principles and agents used in asthma therapy in the mid-19th century (Table) and the use of some agents described there certainly have, from our point of view, a rational background.



ON

ASTHMA:

ITS PATHOLOGY AND TREATMENT.

BY

HENRY HYDE SALTER, M.D., F.R.S.

SECOND EDITION.

LONDON:
JOHN CHURCHILL & SONS, NEW BURLINGTON STREET.
MDCCCLXVIII.

Table. Asthma treatment options in the mid 19th century discussed by HH Salter (1868)

Ipecacuanha
Tobacco
Tartar emetic
Chloroform
Opium
Smoking of *Datura stramonium*
Lobelia
Indian hemp
Ether
Strong coffee
Alcohol
'Violent emotion'
Potassium iodide
Inhalation of powdered alum
Burning nitre paper
Regularity of nutrition and life
Cold shower or bath
London air [sic!]
Change of air in general
Inhalation of compressed air or oxygen gas
Galvanism

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In the case of recommending strong coffee in asthma treatment, it has been suggested to 'put Salter in front of those previously credited with the discovery of the usefulness of xanthines in bronchial asthma'.[6] Indeed, his recommendation of caffeine-containing beverages preceded the introduction of theophylline as a bronchodilatator by almost 40 years. Theophylline was isolated in 1888 from the tea plant *Camellia sinensis* and was used as a diuretic but also in asthma treatment after it became available by chemical synthesis in 1902.[7]

Similarly, in an 'equally striking observation'[8] Salter anticipated the use of parasympatholytic (in case of *Datura stramonium*) and sympathomimetic drugs to relieve asthma symptoms. Besides that, he clearly described the sympathetic-parasympathetic antagonism decades before the functions of the autonomous nervous systems were explored and distinguished in the beginning of the 20th century by Walter Holbrook Gaskell (1847-1914).[9]

This antagonism was already seen by Salter:

> Only a certain amount of nervous activity can be in operation at a certain time, and that if a nervous action of one kind comes into operation, another that had been previously going on is immediately depressed or arrested.

This is further explained by the example of two dogs,

> one of which was taken hunting immediately after a meal, while the other was allowed to sleep. In the one that was taken hunting, digestion, on its return, was found hardly commenced; in the other, it was completely over, and the stomach empty.

Eventually Salter concluded:

> The power of strong emotion, or hard study, in retarding digestion, is an analogous fact.[10]

Accordingly, he also observed the bronchodilating effect of what we now call adrenergic or sympathomimetic stimulation and, even more, used it for treatment of asthma attacks. A whole chapter of his book was devoted to 'Violent mental emotion' (or in other words 'fear, excitement, surprise') as a treatment option against airways obstruction and praised as giving almost instantaneous relief: 'The cure of asthma by sudden alarm takes no time.' In this respect, Salter gives some quite impressive examples. So a patient felt instant relief when his neighbours' house burst into flames:

> Previous to the occurrence of the fire he was in bed, breathing with the greatest difficulty, and unable to move. When the excitement of the fire was over, he found that he had been standing in his nightshirt, looking with others out of the window, and that he had forgotten all about his asthma.[11]

Similar effects were experienced after his sister was attacked by a sudden illness that seemed to threaten suffocation:

> he jumped out of bed in great alarm, and found then that his asthma was perfectly cured.[12]

In another case report, a patient felt relief riding a horse quicker than expected:

> I got on horseback with some difficulty, and an anxious hope that the horse would go quietly, to fetch myself an emetic from a town three miles off. The horse ran away with me. I pulled in, at first weakly and almost despairingly, but the need of exertion brought the power: after a run of about a mile I succeeded in pulling up, and was delighted to find my asthma gone.[13]

Obviously, it is hard to intentionally seek relief by surprise or totally unexpected, emotional events. However, Salter gives the example of a lady who was an enthusiastic musician and was that much excited by her own piano playing that she was able to use playing deliberately as an asthma reliever.

The principle of adrenergic stimulation did not became common practice before adrenaline was made available as a drug around 1900.[14] Soon after, the hormone was used therap-eutically, at first as a nasal spray, and from the 1920s onwards by inhalation.[15] In the first half of the 20th century, other sympathomimetic agents became available for use in inhalers, e.g. ephedrine or isoprenaline (isoproterenol). All these agents, however, still led to considerable side-effects, before selective beta$_2$-sympathomimetic drugs became available in the 1960s, about 100 years after Salter's publication.

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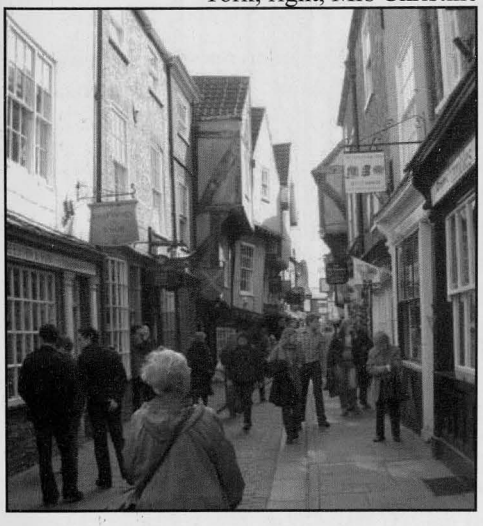
BSHP Annual Spring Conference at Fulford, York 1-3 April 2011

Speakers at the Conference included, left to right: PeterHoman, Stuart Anderson, Shirley Ellis (conference organiser), Roger Mills, President, Renzo Console, Michael Jepson, John Crellin, Ainley Wade.

The Conference audience, above, left and right. Below left, The Shambles, York; right, Mrs Christine Whaley, Anne Hutton and Dr Annette Bierman.



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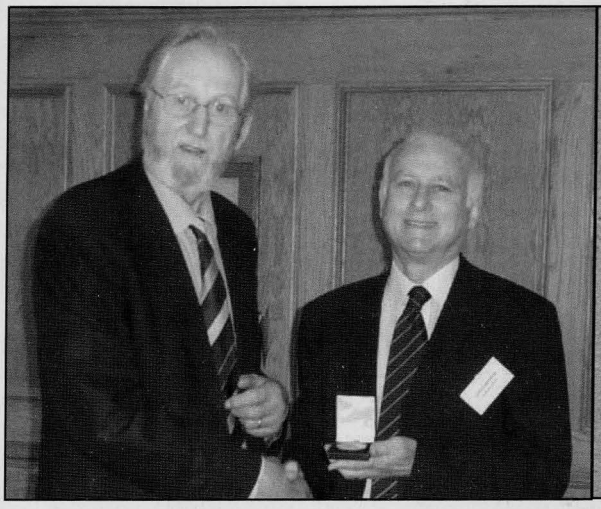
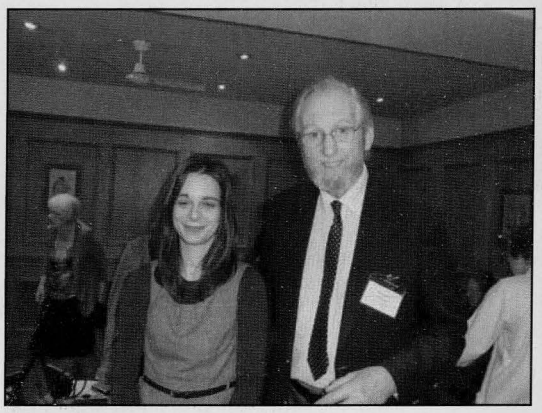


Leslie Matthews Medal Presentations

At the Annual General Meeting, held at Fulford, York on 1st April, the President Roger Mills announced that the Committee had decided to award two Leslie Matthews Medals for 2011.
The first was presented to Dr Stuart Anderson (above) of the London School of Hygiene and Tropical Medicine.

Later in April Dr Stuart Anderson presented the second Medal on behalf of the President to Dr Peter Worling (above) in Edinburgh.

Joanne Good, pharmacist at The Retreat, who gave a talk on 'A History of *The Retreat, York*'.



Gwendolyn Whitaker, who opened the Annual Conference with a talk on 'Making Museums: the story of Dr Kirk', with Roger Mills.

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British Society for the History of Pharmacy

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Website: www.bshp.org

The British Society for the History of Pharmacy was formed in 1967 under the aegis of the Pharmaceutical Society of Great Britain, having originated from its History of Pharmacy Committee.

BSHP seeks to act as a focus for the development of all areas of the history of Pharmacy, from the works of the ancient apothecary to today's ever changing role of the community, hospital, wholesale or industrial pharmacist. Membership is open to all interested in the aims of BSHP.

Aims

Promotion of historical studies related to pharmacy.
Advancement of knowledge and propagation of understanding of the history of pharmacy.
Publication of the research work of pharmaceutical historians.
Preservation of pharmaceutical artefacts and historic pharmacies.
Support for the work of relevant museums and offering advice on establishment of other pharmaceutical exhibits and on the preservation of pharmacies.
Co-operation with related professions and local historians on medico-pharmaceutical topics of mutual interest.

Pharmaceutical Historian

The *Pharmaceutical Historian* has been published since 1967, at first intermittently, but on a regular quarterly basis from 1972. Issues generally comprise 16 or 20 pages and cover.
An **index** for the years 1967-1995 was published in 1998, for 1996-2000 in 2000, for 2001-2005 in December 2005 and for 2006-2010 in December 2010. They can be viewed on the website.
Papers, short communications and letters in English on any aspect of the history of pharmacy are welcome and should be sent to the address above or by email to *ainley.wade @easynet.co.uk*
Any illustrations are converted to monochrome for printing. Further details of requirements can be found on the website *www.bshp.org* under Publications.

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Membership costs £20.00 per annum and includes:

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Annual Conference, usually in March/April.

Free use of the Royal Pharmaceutical Society of Great Britain's library facilities for research.

Help in historical research and with the identification of artefacts.

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Affiliation to the British Society for the History of Medicine (BSHM).

Application forms are available from the Honorary Secretary at the address above or on *www.bshp.org*

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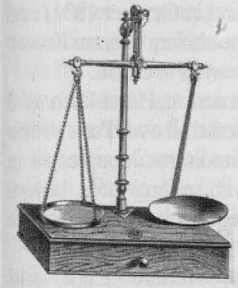

PHARMACEUTICAL HISTORIAN

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Contents

Diary

Because of revised charges for Wednesdays at the RPS, Lambeth, the longstanding arrangements for meetings have been reconsidered by the Committee.

Note earlier starting time and changes of dates for meetings

Monday 10 October 2011

'The History of Medicines Registration' by Diane Leakey. 5.00 at Lambeth.

Wednesday 2 **November 2011**

'Plague in 17th century Suffolk' by Pip Wright. At the School of Pharmacy, University of East Anglia, Norwich. Details to be confirmed by circular.

Monday 13 February 2012

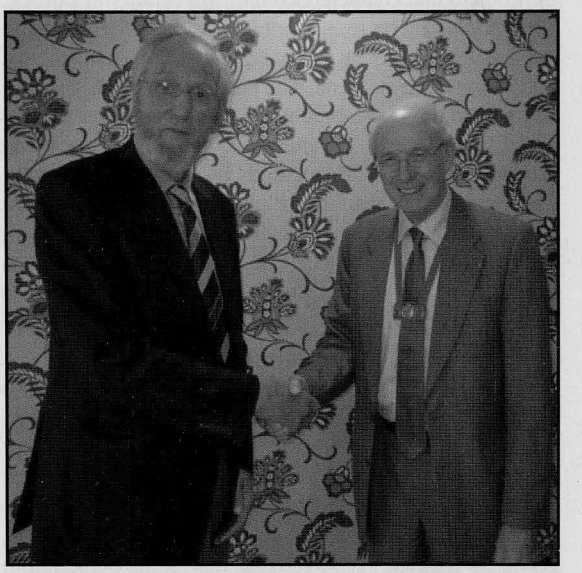
'The History of Doping in Sport' by Prof. Tony Moffat, Emeritus Professor of Pharmaceutical Analysis, London School of Pharmacy. 5.00 at Lambeth.

Future dates

14 May, 8 October 2012 to be confirmed.

40th International Congress for the History of Pharmacy, Berlin, 14–17 September 2011: Pharmacy and Books

To be held at the Berlin-Brandenburg Academy of Sciences and Humanities, Markgrafenstraße 38, 10117 Berlin. See www.40ichp.org/



New President

Mr Roger Mills congratulates Mr Trevor Whaley, new President of BSHP, at Lambeth, May 2011.

BSHP Annual Spring Conference 2012 Call for Papers

The annual conference 2012 will be held from Friday 30 March to Sunday 1 April at the Abbots Barton Hotel, Canterbury.

Taking our cue from Canterbury itself with its wide connections geographically, ecclesiastically, in literature, botany and even furniture we are not proposing a set theme this year. All contributions welcome but if we are oversubscribed papers with a link, however tenuous, to our venue will be given priority. Presenters are usually given 25 minutes , which should include time for questions.

If you would like to present a paper please let Shirley Ellis have a preliminary title by the end of December.

Dr S Ellis, 1 Willow Way, Bottisham, Cambridge. CB25 9BS or e-mail shirleyellis@shirlellis.plus.com

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The Treatment of Cholera in Ferrara (Italy): the European epidemic scenery in the first half of the 19th century

Chiara Beatrice Vicentini,[1] Lorenzo Altieri[2] and Stefano Manfredini[1,2]

[1]Department of Pharmaceutical Sciences and [2]Ambrosialab srl, University of Ferrara

This work describes the cures and the remedies used for the cholera that characterised the 19th century in Europe. Ferrara was taken as a model to analyse the illness in comparison with other European cities like Vienna, Paris, and the nearest, Bologna. The period under investigation starts from the first moment the disease appeared (1830) to 1867. Several differences were found between continental and British methods of fighting the disease. The British physicians were much more on their guard thanks to their great colonial experience, anticipating today's methods. In the Papal States, Ferrara, Bologna and Rome, of course, followed Paris and Vienna's tendencies of the time.

Introduction

Except for some sporadic cases in the south of the continent, cholera never crossed the borders into Europe until 1830. Before this date, this illness was just a matter of erudition, except in the case of the British physicians belonging to the British East India Company.

At first it was treated with calomel, bismuth, cajuput oil, and saline solution. As we can read from some extracts from Riga's Assemblies in 1831, *sal marino*, sodium chloride, was recognised as an excellent solution in Kuppfer and Mende's opinion.

The same remedies would have been adopted in Saint Petersburg and Moscow with success. We can find reference even earlier, in Asia under the names of Searle and Short, where they were mentioned as domestic remedies. Emetics were recognised as very helpful in Vienna.

Bleedings were considered a good solution as they were employed at the right time. It was necessary to get the body warm artificially and to reduce vomiting, pains and convulsions. External (stimulants, vesicants, sinapism) and caustic remedies were usually suggested. Sedatives, antispasmodics and enemas of laudanum in particular were also advised.

When Vienna's cholera outbreak started in 1831, everything possible was done at the time to stop the plague: strict quarantine; restrictions on commerce and severe public hygiene rules. The city was divided into four parts, and districts into twenty. Each single part of the city was governed by a different political administrator. A free physician was assigned to each part. Well known and accomplished citizens had to care for poor people in need of help twice a day. Appropriate hospitals were prepared for those affected by cholera. A special physician could tell if the patient was dead, either with wax drops on the stomach zone, or with a red-hot iron on the sole of the foot.

The disease appeared in Sunderland in October 1831, and in London in January 1832. When the cholera overran France in 1832, physicians tried to find new ways to cure it.

Magendie's punch was largely used at Hôtel-Dieu and advertisements about that were plastered all over Paris streets in the form of cartoons. In one cartoon, two couples sit at tables back to back; the first pair, with smiling faces, have a bowl of punch before them, the other two contemplate some ice with less satisfaction.

In 1832 Agostino Cappello, Achille Lupi and Domenico Meli researched all the best methods of treatment of the time as envoys for the Pope. Despite the severe sanitary rules, the disease appeared in Italy in 1833, because of some smugglers coming from France through Cuneo. From 1848 severe rules to avoid the disease were established in the Papal States. In 1848 the disease was spread in the South of the Empire because of some Austrian troops and later, in 1849, also in Veneto, Lombardia and Piemonte. The arrival of some troops from Rovigo definitely contaminated Ferrara. The fourth widespread epidemic of the century was between 1865 and 1867.

In this work, Ferrara is taken as a model for comparison with other European cities like Vienna, Paris, London and the nearest, Bologna, from the first time the disease appeared in 1830 until 1867, in order to examine accurately all the cures and remedies against the European cholera during the epidemics of the 19th century.

This work represents another contribution to the picture of therapeutic approaches in Ferrara to the typical illnesses of the century.[1,2]

The sources: documents and reports of the time

Luigi Bosi (1809-1883) is one of our sources on cholera in Ferrara. On November 15, 1847 he became professor of Medicine at the University of Ferrara on *Medicina Teorico-Pratica*.[3] As well as writing a report about the epidemic in 1849, he published all his lessons about the disease in 1866.[4]

Within the volume *La Relazione sul colera*,[5] treasured in the *Biblioteca Ariostea* Library of Ferrara, there are two copies of a circular from 1855, a manuscript and three brief treatise pamphlets.[6-10] One of them is by Antonacci and was printed in Ferrara.[9] It was very helpful in guiding us in research about the epidemic of Ferrara in 1854.

Pietro Antonacci was a Roman Jesuit pharmacist and also nurse of the *Collegio urbano De Propaganda Fide*. He wrote texts about medicine, botany, pharmacy, chemistry, and physical science for missionaries. Indeed, Clement XII gave the missionaries permission to practise medicine and surgery in 1735.

He was a very cultivated person that published the *Regolamenti preservativi e curativi del Cholera morbus asiatico*[9] (Directions on how to preserve and cure the Asian cholera) and that became an important point of reference for the city of Ferrara..

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Another important reference is Antonio Campana, physician and professor of Pharmaceutical Chemistry and Botany at the University of Ferrara, famous for his *Farmacopea Ferrarese* and its many editions from 1798 until 1841, well known both in Italy and abroad.[11]

Agostino Cappello, Achille Lupi and Domenico Meli's works, *Storia Medica del Cholèra indiano osservato a Parigi*[12] (A medical history of Indian cholera observed in Paris) and *Risultamenti degli studj fatti a Parigi sul Cholera morbus*[13] (Results of the studies in Paris on cholera disease), are a good reference about Paris, where they were sent by the Pope Gregory XVI in 1832. Other references are: for Vienna by Giovanni Dietz's work in 1835, *Il cholera in principal riguardo alla sua diagnosi, patogenia e cura*[14] (The cholera in particular about diagnosis, pathogenicity and cure); for London with what is reported in *The Lancet* (1831),[15] the *London Medical Gazette*[16] in 1832, in *Cholera: its pathology, diagnosis and treatment*[17] in 1865 by William Story, in *Report on the cholera epidemic of 1866 in England*[18] plus other sources[19-23]; about Bologna in Italy we have found one work (1857), *Cholera Morbus nella città di Bologna l'anno 1855, Relazione della Deputazione comunale di Sanità*[24]. (Cholera disease in the city of Bologna in the year 1855, report from city health deputy).

Ferrara and Bologna belonged to the Pontifical States, with Rome as capital, and they had common rules. Luigi Bosi tells us very clearly about the situation and the rules during the epidemic in 1849 in his *Relazione sul Cholera morbus che dominò nella città e provincia di Ferrara* (1851).[5] (Report on the Cholera disease which dominated in the city of Ferrara and surroundings). The main text is about the therapeutic methods in Ferrara and in the neighbourhood and the results obtained. At the end are reported the rules enacted by the *Commissioni Provinciale e Comunale di Sanità* (the Main Sanitary Committees) to the *Deputazioni sanitarie figliali della Città e dei Borghi* (local Sanitary Committees). Disinfectant equipment and medicines (compulsory requirements held in a storage area), rules of the *Ospitale d'osservazione pei Cholerosi in Mortara* (Hospital for observation of the infected in Mortara) and instructions for the citizens are reported. Concealment of the disease from the public and remedies are also reported.

In the report Bosi explains the method for curing all the stages: the first (premonitory stage); the second (stage of collapse or the algid [cold and clammy] or asphyxial stage); and the third (reaction stage).

The Jesuit Pietro Antonacci's *Regolamenti preservativi e curativi del Cholera Morbus Asiatico*[9], will guide us to learn more about the next and much more violent epidemic in 1854. The physician Francesco Valori (member of the Sanitary Committee) wrote appreciative words on Antonacci's works: it is described as the most comprehensive report on remedies used either in the past (1837) or current epidemics. One of the aims of Antonacci is to enlighten the missionaries' work in far regions of the world. As a consequence the complementarities of experiences of the missionaries is accurately described. It mentions the 1837 epidemic (without mentioning that of 1849). The missing coincidence regarding the two epidemics maybe due to the fact that Antonacci was Roman.

The last edition of the *Farmacopea ferrarese*[11] by Campana in 1841 preceded the epidemics that developed in Ferrara in 1849 and in 1855. The words '*Cholera morbus*' are mentioned four times: under *Sotto-deutonitrato di Bismuto* o *Magistero di bismuto; Bevanda del dott. Gallereux contro il colèra morbus; Olio di Cajeput*; and *Moschus moschiferus*. Even when cholera is not directly mentioned, it is implied in the remedies used to resolve the various symptoms of the illness. Campana will be mentioned in the following sections in cases where elements match his Pharmacopoeia.

Cholera symptoms

The disease of the 19th century was described by Affleck in these words:[25]

> In describing the symptoms of cholera it is customary to divide them into three stages, but it must be noted that these do not always present themselves in so distinct a form as to be capable of separate recognition. The first or premonitory stage consists in the occurrence of diarrhœa. Frequently of mild and painless character, and coming on after some error in diet, this symptom is apt to be disregarded. The discharges from the bowels are similar to those of ordinary summer cholera, which the attack closely resembles. There is, however, at first the absence of vomiting. This diarrhœa generally lasts for two or three days, and then if it does not gradually subside either may pass into the more severe phenomena characteristic of the second stage of cholera, or on the other hand may itself prove fatal. The second stage of cholera is termed the stage of collapse or the algide or asphyxial stage. As above mentioned, this is often preceded by the premonitory diarrhœa, but not unfrequently the phenomena attendant upon this stage are the first to manifest themselves. They come on often suddenly in the night with diàrrhœa of the most violent character, the matters discharged being of whey-like appearance, and commonly termed the "rice-water" evacuations. They contain large quantities of disintegrated epithelium from the mucous membrane of the intestines. The discharge, which is at first unattended with pain, is soon succeeded by copious vomiting of matters similar to those passed from the bowels, accompanied with severe pain at the pit of the stomach, and with intense thirst. The symptoms now advance with rapidity. Cramps of the legs, feet, and muscles of the abdomen come on and occasion great agony, while the signs of collapse make their appearance. The surface of the body becomes cold and assumes a blue or purple hue, the skin is dry, sodden, and wrinkled, indicating the intense draining away of the fluids of the body, the features are pinched and the eyes deeply sunken, the pulse at the wrist is imperceptible, and the voice is reduced to a hoarse whisper (the vox cholerica). There is complete suppression of the urine. In this condition death often takes place in less than one day, but in epidemics cases are frequently observed where the collapse is so sudden and complete as to prove fatal in one or two hours even without any great amount of

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previous purging or vomiting. In most instances the mental faculties are comparatively unaffected, although in the later stages there is in general more or less apathy. Reaction, however, may take place, and this constitutes the third stage of cholera. It consists in the arrest of the alarming symptoms characterizing the second stage, and the gradual but evident improvement in the patient's condition. The pulse returns, the surface assumes a natural hue, and the bodily heat is restored. Before long the vomiting ceases, and although diarrhoea may continue for a time, it is not of a very severe character and soon subsides as do also the cramps. The urine may remain suppressed for some time, and on returning is often found to be albuminous. Even in this stage, however, the danger is not past, for relapses sometimes occur which speedily prove fatal, while again the reaction may be of imperfect character, and there may succeed an exhausting fever (the so-called typhoid stage of cholera) which may greatly retard recovery, and under which the patient may sink at a period even as late as two or three weeks from the commencement of the illness.

Special symptomatic suggestions were: stopping vomiting and diarrhoea; alleviating cramps; quenching the patient's thirst; reinforcing the body; and strengthening patients that often appeared to be dead.

The remedies in Ferrara compared with those of London, Vienna, Paris and Bologna

Environmental disinfection met with success due to a universally recognised method: *Suffumigi di Guyton Morveau*. The method is reported by Campana as the production of chlorine gas from manganese oxide and sodium chloride/sulphuric acid or nitric acid/hydrochloric acid. It was also possible to use a hand-held disinfectant bowl (*boccia disinfettante*), when necessary, with a security screw to open it.

Smith's method (potassium nitrate instead of sodium chloride, with nitrous acid production) was present only in the Ferrara document in 1848, where you were also recommended to grease your hands with oil before touching the sick and then to wash them with chloride of lime and vinegar. Chloride of lime is mentioned by Campana as helpful for avoiding this illness.

The *Aceto de'4 ladroni* (Vinegar of the four thieves) mentioned by Antonacci is present in Campana under the heading *Acido acetico aromatico, aceto aromatico o dei quattro ladri.* It is based on rosemary, absinthe, sage, rue, calamus, cinnamon, cloves, vinegar, camphor and, if you prefer, on garlic. Antiseptic and anti-plague effects were achieved by wetting hands and face.

Vinaigre des quatre voleurs is mentioned in the work of Vienna as something that had to be brought in a small bottle to moisturise inner parts of the nose or to be inhaled. It could be substituted by vinegar or chloride of lime.

Acqua della scala was also recommended by Antonacci (distillate of rosemary, rue, mint, absinthe, scurvy grass, roots of angelica and zedoary in alcohol, in addition to sandalwood, camphor and Peru balsam) and, as an alternative, either aromatic and smelling essences or camphor. Antonacci, as a Jesuit, had been influenced by the experiences of the missionaries.

As well as aromatic lozenges, *pastine aromatiche,* made of peppermint or myrrh and sugar cubes flavoured with camphorated spirit, or Hoffmann's ether for their preservative properties (very useful for the priest confessors), he praised the value of some anti-cholera pills based on camphor and *oppio tebaico* (opium), used by the wealthier classes in India..

The observations on the practice of disinfection give the very detailed instructions contained in the *Report on the cholera epidemic of 1866 in England.*[18]

I would say, by way of summary that for the disinfection of sick rooms, chlorine and chloride of lime are the best agents; for the disinfections of drains, middens, and sewers, carbolate of lime, and carbolic acid are the best; for the discharges from the body carbolic acid, chloride of zinc, or chloride of iron are the best; for clothing, the best disinfectant is heat, above 260°[F] if a dry heat and 212° if a wet heat; and for drinking water, filtration through animal charcoal and a boiling temperature.

More than the usual hygienic rules, including disinfection of the environment, boiled water was considered as a very important element in this document. The methodical and rational cure of cholera can be divided into three periods:

premonitory or cholerine stage,

algide stage and

reaction stage (*periodo dei prodromi, periodo irritativo-algido, periodo di reazione*). During these periods it was necessary to recreate all the mentioned therapeutic instructions: physicians would have to find the right cure for each specific case.

In Campana's pharmacopoeia under the heading 'Cholera morbus' four medicines are mentioned:

Bismuth subnitrate, was considered as an excellent remedy by Dr Leo, as it was mainly characterised by sedative and antispasmodic features useful against Asiatic cholera.

Dr Gallereux's beverage (*Bevanda del dott. Gallereux*) against cholera was made with poppy infusion, orange water, ipecacuanha powder, syrup of *diacodio* (made with poppy heads), and sulphuric ether. It had to be conserved in a crystal container, and shaken before being used.

From *cajuput leaves* (cited in Campana as *Cajeput, Melaleuca leucadendron*), a green strong-smelling cajuput oil was obtained. It helped to alleviate headaches and was thought to protect against cholera. First observed by the explorer James Cook, the efficacy as an anti-infective essential oil obtained from the Myrtacee family has been confirmed by recent studies.

Antispasmodic moss (*Moschus moschiferus*) was also considered a good remedy to avoid the epidemics.

All these remedies were suggested as soon as the disease appeared in Europe but were were not confirmed as useful in the following years. Working remedies were also criticised.

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Magendie prescribed his famous '*punch*':[16,26]

1 pint of infusion of camomile,
2 ounces of alcohol,
1 ounce sugar and lemon juice to taste,

and with it friction with camphorated spirit, ammonia or turpentine, hot beds and hot sand bags.

Administering *oxygen* was also useful. Attention was more focused on symptomatology and it was considered that patients had to be helped with emetics at first. Several doses of olive oil (with some drops of Sydenham's laudanum, broth and cold rice water) were sufficient to cause the vomiting, as suggested by Antonacci, or using the normal ipecacuanha. Ipecacuanha (containing emetine) and Dover's powder (suggested in Vienna and Bologna), that contained opium in addition to sugar, are also present in Campana's pharmacopoeia.

On the other hand it was necessary to stop excessive vomiting and diarrhoea.

Besides zinc oxide and bismuth, other potions based on Sydenham's laudanum and Hoffmann's ether, the use of *Antiemetico del Riverio* or *Potus Riverii* was recommended all over Europe. It was prepared by adding lemon juice to potassium bicarbonate and sugar dissolved in water (as reported by Campana and Antonacci) or by adding tartaric acid to sodium bicarbonate (as reported in the Vienna document). In all those cases in which diarrhoea and vomiting could not be stopped, gum emulsions with liquid laudanum of Sydenham or tincture of opium were suggested. In Antonacci's opinion laudanum or tincture of opium should be added to gum arabic powder dispersed in water or, better, almond milk. Liquid laudanum of Sydenham, Hoffmann's ether, and tincture of opium preparations were described in Campana's Pharmacopoeia.

Frozen drinks, fountain fresh water or simply ice were suggested (called glacial pills in Vienna; snow or frost by Antonacci).

Organic or mineral acids were used at all stages of cholera with water and mucilaginous drinks or other remedies to mitigate the thirst. Organic acids were employed during the premonitory and the reaction periods, mineral acids when the cholera had already developed.

The Vienna document gives prominence to, among the organic acids: citric acid, tartaric acid, acetic acid; for mineral acids: sulphuric acid with alcohol; and acid liquor Halleri (also mentioned in Campana). Antonacci suggested that beef tea and decoction of rice could be replaced during the recovery with decoction of tamarind (also mentioned by Campana). Tamarind was also employed in Bologna and Vienna.

Enemas were used in different ways. They were often made with a decoction of rice and starch. The formula made in Ferrara in 1849 was just the same as that employed in Paris:[13] an enema with decoction of salep, rice, a mucilage of starch and gum arabic with drops of Sydenham's laudanum. Paris[12,13] also considered other solutions: enemas of rhatany, diethyl ether and laudanum, or just laudanum.

Enemas with decoction of rice and starch, enemas of laudanum, rice, starch, egg-white and alum were employed in Bologna, while in Vienna enemas with glacial water were used instead. Antonacci advised enemas with infusion of camomile and olive oil, with decoction of rice in the first stage; with rubber emulsion and rice water or with beef-tea and starch in the algid stage; and enemas with barley and honey in the reaction stage.

The Ferrara document of 1849 recommended *acqua stibiata*, while Paris, Vienna and Bologna used *tartaro stibiato* (potassium sodium tartrate) as diaphoretic. Other particular remedies like *Gocce di salute del Dott. Chronicle*[27] (Dr Chronicle health drops) were found (but only mentioned in the Bologna report). In the *Cronaca di Bologna* they are mentioned as the only remedy during the epidemic in 1855 together with Hoffmann's drops and laudanum. They were administered in the second stage.

Spirit of lavender, mint oil, tincture of opium in a cup of coffee, with hot water, once every five minutes, were employed to return the patient to a normal temperature; then it was administered each half an hour, gradually decreasing in frequency or increased if needed. This coincides with Java's method,[28] taken in doses of a spoonful, until the vomiting ceased. Atropine was also used in Bologna against the hiccups.

In the Paris document[13] (epidemic of 1832) and in Ferrara (epidemic of 1849) Marc Powders appeared. These consisted of a grain of soft extract of opium, triturated with two grains of gum arabic and a half scruple of calumba root and a scruple of mint sugar. Calumba is cited in Campana as *Menispermum palmatum*.

In 1849 Frank's Resolvent Powders (*Polveri risolventi del Frank*) were employed in Ferrara. Campana calls them *Pillole di sanità* or *Grani di salute del Dott. Frank*. They are made up of Socotrine aloes (*Aloe squarrosa* di Socotora), colocynth and spirits, enough to create pills.

In the Paris documents[12,13] Guaco is mentioned and quoted by Campana (Mikania Guaco). It is effective against poisonous snakes in South America. It was tried at the end of the epidemic; therefore they had no exhaustive data.

It was possible to have complications with worms (only referred to in children in the Vienna document). The phenomenon was very widespread in the south of Europe. Asafoetida and Coralina enemas (*Muscus maritimus*) are in the Bologna document. Bosi in Ferrara suggests anthelmintics and *Nicotiana,* and carminative enemas to eliminate swallowed air. It was also necessary to alleviate stomach aches, cramps and the cold state of thepatient.

The remedies adopted and common in the rest of Europe are very well described and summarised in English documents.

> If the tendency to vomiting be great, sinapism applied to the epigastrium will prove serviceable … The application of heat is of utmost importance, and that it should be aided by the assiduous employment of frictions, not only to the extremities, but also to the trunk itself, and particularly along the course of the spine, in which region some stimulant embrocation … To apply heat to the surface of the body, especially to the extremities.[20]

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> Heat was also now applied, and the patient wrapped up in warm blankets and hot bottles, or bags of heated sand placed around his cold and benumbed body … Other methods of restoring warmth were also had recourse to, as frictions with the hand, or by flesh-brush, or rubbing the body with some stimulant embrocation, compounded of garlic, capsicum, camphor, cantharides, or other powerful irritant. Mustard poultices also were often applied to the feet and abdomen, blisters with or without an addition of oil of turpentine, the part having been previously rubbed with hot sand; and in more urgent case, the mineral acids, and even boiling water were employed for the purpose of producing instant vesication. And again, other practitioners tried to stimulate the waning powers of life by galvanism, acupunctuation of the heart, issues, setons, moxas, actual cautery along the spine, and lastly, by small pieces of linen dipped in alcohol, and distributed over the body, and then set fire to.[21]
>
> Sinapism applied to the abdomen … Frictions of turpentine … Turpentine to be rubbed along the spine. With external heat, frictions of turpentine are most beneficial in allaying cramps … The steam jet could be [used] as a rubefacient along the spine … Heat promoted by bottles of hot water.[17]

In the Ferrara Report on the epidemic in 1849 we find poultice of linseed meal with laudanum of Rousseau, as used in Paris.[13] The *Laudanum de l'abbé Rousseau*[29,30] is an opium wine prepared by fermentation. It is obtained from the fermentation of fine honey in water, by adding some beer-yeast if necessary, and containing opium of course.

In the Paris document,[12] bandages were suggested for cramps. *Empiastro di mentastro* (poultice of *Nepeta pannonica*) was employed in Bologna.

Mustard was added to vinegar in Vienna, and either *armoracia* (horseradish), tincture of cantharides, or sulphuric acid as you wished. Antonacci added breadcrumbs, vinegar or *aceto scillitico* (squill vinegar) to mustard and he also suggested frictions by flesh-brush or beatings with thin twigs, wicker or whalebone, while flesh-brush, chloride of lime and garlic were used in a Bologna. Frictions with mercurial ointment are mentioned only in Paris.[13]

Indostan Therapy was reported as the best method in Paris:[12] frictions with irritants and administration of tea drinks to encourage sweating. Vesicants were often used, but in Bologna they were unusually made of cantharides. In Paris[12,13] and Bologna nettles were applied to patients.

Warming and cooling

In the second algide stage they tried to help warm the body. The machine used in the Paris Hospitals was useless (and harmful) for warming patients in an algide stage:

> The sweating machine of D'Anvers, the warming bed of Dr Mackintosh and Grant's commended radiator, were and are the heating apparatuses that were in great vogue in Germany, England and France.[13]

The warming bed of Dr Mackintosh (maybe the director of Drummond Street Hospital, Edinburgh) was described in the *London Medical Gazette* of 1832 as the Hydrostatic bed for invalids:[16]

> This bed is in itself as dry as a bed can be, for the India-rubber cloth (of which bottles can be made) is quite impermeable to water, and the maker is now preparing cloth expressly for this purpose… If used without the mattress, it becomes a warm or a cold bath, not allowing the body however to be touched by the water.

The name does not seems to refer to the director, rather to 'the manufacturers of the water-proof cloth, Mackintosh and Co.' It seems to be very similar to Dr Arnott's 'Floating water beds, the new elastic hot and cold water beds'.[22]

The Principles and Practice of Medicine[19] in 1834, describes a solution:

> In the cold stage, common sense would point out that there should be plenty of covering, and warm drinks; and some have recourse to the warm bath. It would, however, I conceive, be better to employ dry heat; for warm air may be easily and instantly conveyed to a patient when in bed, by having something under the clothes to raise them, and a tube continued from above a spirit lamp. Thus you surround the patient with hot air; and you may convey it in any quantity you please, and of any temperature. Something like an inverted funnel is placed near the bed, with a spirit lamp under it; a tube goes from the extremity of this funnel-shaped body, and is conveyed under the bed clothes; so that the air is dispersed throughout the bed. The degree of heat may be regulated, by altering the proximity of the lamp to the funnel. I think, if the cholera should make its appearance amongst us, this will be found by far the best mode of applying heat externally; and on this account, particularly; that when you employ vapour, the patient for the most part must be in a sitting posture; or at any rate must be taken out of bed, and more or less exposed after the bath. But, in extreme exhaustion, it is a material thing to avoid all this, and to keep the person horizontal; and by using the contrivance I have mentioned, you need not take him out of bed, or remove him from the horizontal posture. Heat may thus be employed, to an extent sufficient thoroughly to warm the surface; and friction, especially to the extremities, may be had recourse to at the same time; just as grooms rub shivering horses, on the legs, and even on the ears. I imagine that this contrivance will be found much better, than either the hot water or the vapour bath. (Mr Dalton's vapour bath is mentioned in a document[21] in 1845.) This note about these lines is about the physician and the Hospital. Since these observations were delivered, the cholera has made its appearance among us; and the contrivance indicated was extensively employed. Having been led to the subject, we may notice the admirable manner in which heat was applied externally, in the Cholera Hospital at Edinburgh. Every bed was furnished with a hollow "tin-mattress" (as it was called); which could, at any time, be rilled with steam, by means of a pipe which communicated with a boiler. This hospital, besides the unwearied services of Dr. Mackintosh, enjoyed the advantage of being superintended by Mr. Meikle, surgeon in the East India Company's service; who brought to the task an extensive acquaintance with the disease in India, and the experience derived from repeated attacks of it on his own person.

It is very similar to the bed of D'Anvers. In the Paris document[12] this machine is described as:

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The sweat machine of Dr D'Anvers, a withy arch placed over the bed of the patient and communicating with a curved tube at the base of which is an iron lamp fed with alcohol that, when lighted, warms up the patient's temperature to 80°C.

In Vienna and London applications could be hot bricks to the extremities, bags of ashes, sand, oatmeal, fomentations with herbs, or clay pots full of boiling water, all applied to the various parts of the body and warm blankets. Antonacci suggested the use of bed-warmers and braziers. In Ferrara (1849) and Bologna hot bricks were used mostly. In Paris[13] also 'exhausters' with boiling water were employed. In Paris[12] red-hot iron had to be applied to the heel and all along the spine after placing small pieces of linen dipped in alcohol or in *linimento volatile* (liniment composed of liquid ammonia, olive-oil) and turpentine oil.

In Vienna, *cold* fomentations, coarsely crushed ice in a pig's bladder or simple cloth soaked in ice water, enemas with ice water, ice frictions were alternated with hot cloths. Infusions with cold water were suggested where the patient sat with up to half of the body in a bath alternating with hot cloths. The skin surface acquired an intense red colour, the pulse became progressively more sensitive, and the blood circulation and the body heat were restored. We found the same hot/cold technique also in Ferrara in 1849: cloths with cold water, frictions with spirit and stimulants to help sweating. In Paris[12], buckets of cold water were alternated with warm cloths.

One of the works contained in Bosi's book is *Précis de la nature et du traitement du Choléra asiatique*[10] by Scharlau, published in 1854. This author can be considered as a link between Ferrara and Europe as he was 'Docteur en médecine et chirurgie, membre correspondent de la société médicale à Londres et Stockholm, couronné par l'institut impériale des sciences et des beaux arts à Venise et par l'académie de la médecine et chirurgie à Ferrara'.

Beside the oral administration of ice, a cold/warm treatment was suggested:

> Un remède sublime, c'est la glace, donné fréquemment par petits morceaux et en état d'eau glacé. S'on emploi, produit l'effet le plus efficace contre le vomissement et la soif ardente. Une compresse, trempée dans l'eau glacé et appliquée sur le creux de l'estomac et aussi souvent rénouvellée, qu'elle devient chaud, fait disparaître l'anxiété et les vomissements. En voyant un malade cholérique, auquel on n'a pas encore appliquée de rémèdes, dont le pouls est insensible et la peau froide, on le deshabille, le place dans une bagnoire et lui fait des affusions d'eau froide, pendant 2-3 minutes et puis des frictions d'eau froide. Après cette opération on le fait placer au lit, bien couvrir de couvetures de laine, pour provoquer la transpiration.

This technique was supported by some, while others rejected it. Story said:[17]

> The treatment of cholera by cold, both internally and applied to the skin, appears incomprehensible.

The London report commented:[16]

> Cold affusion, as recommended by some of the Germans, has been tried in Paris during the cold stage; it has often appeared to hasten the fatal results, and never has been of any obvious service.

By following the French methods, Ferrara started to use epigastric and precordial ventouses [application of vacuum].

Other treatments

In Paris[12,13] and London[17,21] stimulation by *electricity*, galvanism and, in Bologna, electromagnetic current by Dr Concato of Padua were tried.

Acupuncture was reported in Paris:[16,19]

> Breschet has had acupunture performed between the fifth and six ribs. The needle was three inches long, and only six lines of it remained outside; so it was believed to have been "buried in the heart", -- the object in view. Galvanism was then applied; the heart beat strongly, and the patient appeared to suffer a great deal, but no permanent advantage seems to have been derived. Galvano-puncture has also been tried, but in a manner somewhat different, by M.Bally (Paris). One needle was introduced over the cervico-vertebral column, and another over the lumbar, or the stomach, but pushed somewhat obliquely, and not to any great depth. The battery employed was from ten to thirty-six pairs of plates, and the time of each discharge was about eight minutes. In the case of four men and two women thus treated, there seemed to be some improvement; but, by the latest accounts, we learn that no permanent benefit was derived, and that electro-puncture practice has consequently been abandoned.[16]

Benefits deriving from the use of *bleeding* were made according to the physician's discretion depending on the case. In Ferrara the use of *leeches* (*mignatte)* was mentioned, while leeches and cupping-glasses (*coppette scarificata*) were employed in Bologna.

> Cupping in its most ordinary form consists in the local abstraction of blood from minute incision by means of atmosferic pressure; cupping-glasses, a scarificator, and a spirit-lamp, are required for the performance of this operation. Cupping-glasses are of various forms and sizes, but, for the most part, narrow at their necks and somewhat dilated at the opposite extremity. They are employed for creating a partial vacuum over that part of the surface from which the blood is abstracted; the air within them is rarefied by introducing for a second or two the flame of a spirit-lamp; on the withdrawal of this, the open mouth of the glass is immediately applied to the part to be cupped. … The scarificator is used for simultaneously and quickly effecting the necessary incision for abstraction of blood.[23]

In the search for links with the causes of the disease the *weather* was considered, by comparing every day each single aspect of the weather with the number of deaths or recoveries (sky conditions, prevailing winds, rainfall and data recorded with the barometer, thermometer and hygrometer).[5, 22, 24] Olmsted reported:[26]

> Magendie's guess as to the origin of the epidemic was influenced by the age-old superstition regarding "bad air", for he proposed in the Academy of Sciences that analyses of samples of air from different parts of the city might afford a clue. The Academy evidently thought seriously of carrying out this suggestion, and at once appointed two of the most celebrated chemists of the day, Gay-Lussac and Thénard, to act with Magendie in the quest. It was undoubtedly this particular attempt to solve the mystery of the origin of cholera which influenced Bernard in a later epidemic to collaborate with Pasteur in an attempt to isolate the cholera germ by

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18th century Bragliani Pharmacy, University of Ferrara

collecting air in the cholera wards of the hospital. It was not until Koch discovered the spirillum of Asiatic Cholera in 1883 that the methods of inoculation, to be initiated even later by Pasteur, could be applied to the cure of cholera.

Symptomatic treatments for cholera, with some variations, also found success beyond the English Channel.

Saline fluids

O'Shaugnessy's intuition was extremely modern, by foreseeing today's treatments. William Brooke O'Shaughnessy, a recent graduate of Edinburgh Medical School, proposed in *The Lancet*[15] injections of salts to treat the 'universal stagnation of the venous system and rapid cessation of arterialisation of the blood' seen in severely dehydrated cholera patients. His proposal was soon adopted by the physician Thomas Latta. The solutions contained a range of concentrations of sodium, chloride, potassium, carbonate, phosphate, and hydroxide. The breakthrough in achieving physiological concentrations was accomplished by Ringer in 1831, when he determined the optimal salt concentrations to maintain the contractility of frog heart muscle.

The news was widely reported in the newspapers of the time. The *London Medical Gazette*[16] (1832) reported:

> William Brooke O'Shaughnessy: as a result of his analysis of the blood of cholera victims Dr Thomas Latta of Leith introduced intravenous fluid and electrolyte-replacement therapy in the treatment of cholera.

In the London document *Cholera: its pathology, diagnosis and treatment* (1865)[17] William Story, besides recommending the methods practised on the continent, and confirmed by other authors, recommended 'The treatment of cholera ought to be chemical, mechanical, and hygienic' and pointed out 'The remarkable effects produced by transfusion with saline fluids I shall never forget'. As well as intravenous saline treatment:

> Inhaling oxygen gas I hold to be advantageous. I should also strongly recommend injecting the bladder, before proceeding to transfusion, with the saline solution as given by Drs. Taylor and Rees. The bladder is more fitted for this solution from the nature of its structure than the veins. … one of the elastic bottles with a tube at each end, now so common in the druggist shops, with a catheter properly fitted would answer the purpose, a gradual and continued stream could be injected with the greatest ease.

At the end he underlined that practising all the methods described had confirmed the real value of the treatments.

> In addition to all previously-known treatment, the three systems of constant irrigation of the bladder, inhalation of oxygen gas, and inhalation of medicated atomised fluids, merit an extensive trial.

The reaction phase

The last period of reaction should not be undervalued by the physician. When necessary it was possible to intervene with bleedings and analeptics. This phase was important, even if it was not treated with the same intensity as the others.

It is clear from the data we have examined up to now that there was a really great difference between the continental and British methods. English physicians had much more experience and this is the reason why they were in the vanguard and also anticipated today's remedies. The Papal States, Ferrara and Bologna, followed the French and Austrian tendencies of course.

S. Maria delle Grazie di Mortara, Ferrara, 15th century

S. Maria delle Grazie di Mortara convent was built in 1496. After the suppression of monastic orders ordered by Napoleon in 1798 it was used in different ways. It became a barracks and also a Lazaretto during the cholera epidemics in 1849 and 1854.

The hard life of Dr. Luigi Boari at the Lazaretto of Mortara is described in an exceptional document, a preserved letter dated 3 July 1855 to the commission president of health of

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Ferrara. 'Please allow us to spend some time outside as the rooms really smell because of the substances ejected by the sick patients.' (*Eccellenza, il puzzo ... dalle sostanze secrete degli infermi, ... la camera mortuaria che manda un puzzo ..., ci voglia concedere qualche ora d'aria*). On the *recto* and at the end a rare oval stamp of the Lazaretto of Ferrara is imprinted.

Interestingly, after several years and careful restoration work, the Lazaretto's cloister and church are now the 'home' of the authors' Pharmaceutical Science Department and of the S. Maria delle Grazie's University library.

See also two further illustrations on the back cover.

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Professor William Basil Whalley (1916-2002)

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Professor William Basil Whalley joined the School of Pharmacy of the University of London in October 1961 as Professor of Chemistry and Head of the Department of Pharmaceutical Chemistry. He succeeded Professor WH Linnell. I was a research associate with Professor Whalley for an academic year.

This account of Professor Whalley is largely based on material sourced from Profesor Whalley,[1] his Royal Institute of Chemistry file,[2] and the lecture he delivered at the Royal College of Physicians.[3]

By the time Whalley joined the School of Pharmacy, he had established himself as a competent organic and industrial chemist. He was on the faculty of the University of Liverpool as a lecturer (1946-52), senior lecturer (1952-57) and reader (1957-61). He had been drafted into the Government Chemical

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Service (1940-47), partly working at I.C.I. Ltd (1941-45), and was successively a member of and in charge of the Fire Fighting Service Group and Chemical Warfare Detection Group based on the University area of Liverpool (1940-57). He spent his sabbatical at Smith, Kline and French, Philadelphia (1952).

Professor William Basil Whalley[1]

Basil was born on 17 December 1916 at Wallasey, Cheshire. His general education was at a local private school (1923-27) and St Edward College, Liverpool (1927-35). He obtained his BSc degree from the University of Liverpool (1938), where he stayed on to work for his PhD (1938-40) under Professor A. Robertson. In 1939 he was elected to associateship of the Institute of Chemistry, which later became the Royal Institute of Chemistry (1944), and was elected to the royal institute in 1950. Dr Whalley earned his DSc from the University of Liverpool in 1952, for which Sir Robert Robinson was the external examiner. Professor Whalley said about himself in a lecture:[3]

> After graduating in the very late 1930s as a 'straight' organic chemist, I commenced my research work in Liverpool under the somewhat dictatorial but kindly direction of the late Alexander Robertson; my thesis was completed early in 1941, with appropriate time-out for filling sandbags, fighting fires and snuffing incendiary bombs. I was immediately drafted into Government service and quickly found myself in Imperial Chemical Industries Limited where I was at once thrown in at the deep end and involved in the problems of the first commercial manufacture of polyvinyl chloride in the UK. I had hardly seen the inside of a chemical plant prior to this traumatic experience and had to learn, and quickly; frequently we worked 50-60 hour spells without a break. About 1943 when polyvinyl chloride was something of a going concern, I became associated with an investigation known in this country by the code name of the Tube Alloy Project, otherwise recognised in the USA as the Manhattan Project. I thus spent several years concerning myself with the vigorous and unpleasant antics of the tiger of the elements, fluorine. We manufactured fluorine, hydrofluoric acid, tetrafluoro-ethylene, polytetrafluoro-ethylene and various simple fluorinated/halogenated hydrocarbons known in the USA as Freons and subsequently in the UK as Arctons. ... At the conclusion of World War II I was confronted with the choice of remaining with ICI or accepting an offer of an academic appointment at my old University; by a very narrow margin I opted for academic life. ... For the next ten years I worked in close association with Alexander Robertson on the structures of natural products, and was exposed both directly and vicariously to the intellectual rigour of other great classical organic chemists, such as Sir Robert Robinson. This concern with natural products brought, in 1949, my first active contact with the pharmaceutical industry and perhaps the dawn of my realisation of what chemistry had done, and could do, in that industry. It was probably a major turning point in my life.
>
> In 1949 Robertson and I received a visit from a gentleman who was to become a life long friend and colleague, Dr Glenn E. Ullyot, of Smith, Kline and French Laboratories, Philadelphia. The reason for his visit was that we were working upon the structural determination and synthesis of a couple, by modern standards, of relatively simple oxygen heterocyclic compounds. These were Khellin and Visnagin –substances which were reputed to have some desirable medicinal effects upon the cardiovascular system. As a result I ultimately spent most of 1952 at the laboratories of Smith, Kline and French in Spring Garden Street, Philadelphia, as a sort of *gastarbeiter* and consultant. Since that time I have had increasing contact with the pharmaceutical industry on an international basis.

At the London School of Pharmacy, Whalley organised a flourishing centre of research. In his career his research mostly remained concerned with the chemistry of natural products of potential biological significance, particularly steroids, fungal and bacterial metab-olites, stereochemistry and biosynthesis. Dozens of scholars came to work with him from within the UK and from far away Asian and African countries, and some from the USA. Professor Whalley had 244 publications to his credit, mostly research papers but also several scholarly reports, reviews and book chapters.

Professor Whalley lectured and travelled extensively throughout the world. He acted as advisor to industries and universities in developing nations, including India, Rhodesia (later Zimbabve), Malaysia, Jamaica, Trinidad, Barbados, Nigeria, Hong Kong, Singapore, etc.

He had been visiting professor and/or special lecturer, inter alia, at the Ochsner Medical Foundation in New Orleans, Centennial Lecture at Ohio State University, the University of Calfornia, San Francisco, MIT, Harvard, etc. He became an Emeritus Member of the New York Academy of Sciences and an Honorary Member of the Association of Pharma-ceutical Teachers of India.[4] He was member of many professional and scientific bodies and their councils/ committees.

He kept his interest in the developments in the pharmaceutical industry and was consultant to many major pharmaceutical companies including Glaxo, Smith, Kline and French, Eli Lilly, American Cyanamid, Roussel and Wellcome.

In 1974, Profesor Whalley was invited to deliver the Annual Scientific Lecture at the Royal College of Physicians, London, sponsored by the Merck Sharp and Dohme Research Laboratories. The title of his talk was 'Whither the Pharmaceutical Industry?'[3] In his lecture Whalley made several cogent points while surveying the past, looking at the current status, and projecting the future. He said that:

> the pharmaceutical industry will continue to advance in the immediate future and perhaps never at a rate analogous to that of the spectacular past thirty years.

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About innovations in drug discovery he stated:

> Serendipity will always be with us but presumably may be of less frequently advantageous occurrence. ... Random screening is becoming more expensive and less profitable ... Screening will still continue however, to be a method of approach, even if of diminishing significance. Fundamental research is our major hope for the future ... it is here, much more so than in the past, that the pharmaceutical industry will be on its own, and will have to undertake its own fundamental research on a substantial scale.

Regarding the inevitability of consolidation in the drug industry, he made a bold statement:

> Individually, and for reasons of personal loyalty etc., we may very much dislike the idea of the major British pharmaceutical houses being consolidated into Pharmaceuticals UK, but it may be inescapable.

Professor Whalley retired from the School of Pharmacy on 30 September 1982. He was now Emeritus Professor and lived for the following two decades. He passed away on 30 May 2002 after a long and debilitating illness; he was survived by his wife Marie, and children Christopher, David, Kevin, Barbara and Edmund.[5] Apart from death notices no obituary of him appeared.

In response to my letter of condolence, Mrs Whalley sent a short note on Professor Whalley,[6] stating:

> His outside interests were in music, (he had a large collection of records), and a deep interest in USA (primarily SW American) Indian artefacts, about this subject he acquired a large library and a broad knowledge. As an extremely active man, his great love was the English Lake District, that beautiful North West corner of England where he took every opportunity to climb mountains and fells and where, at his request, his ashes have now been scattered. Above all his first love was his family, five children and later his grand children.

Personal Note

I was selected for a Commonwealth Academic Staff Fellowship by The Commonwealth Scholarship Commission, tenable at the School of Pharmacy, University of London, for an academic year (1971-72) and I was to work under the supervision of Professor Whalley. I gained much benefit during the period spent in his laboratory and the Professor was pleased with my work. It may look a little immodest but I am tempted to repeat what Profesor Whalley said to me on the last day of my stay at the London School: "what people do not do in years, you have done in months. Is there anything I can do for you?" On the spur of the moment I said "At the Panjab University I have a successful school of research but my work is handicapped for want of facilities for elemental and NMR spectral analyses." He immediately replied, "No problem, you send the samples to me and the needful will be done." He kept his word and made arrangements for the free facility, even for the period after he had retired from the School. It is hard to believe that this help continued for nearly two decades, till I stopped supervising experimental science. On commercial rates the analyses which were done in London free would have cost me several lakhs of rupees. I did not have that kind of funds available. The generosity of Professor Whalley made me progress as a scientist.[7]

When a couple of decades later one of our synthetic heterosteroids, Chandonium Iodide (INN: Candocuronium Iodide), attained the status of a neuromuscular blocking drug after detailed toxicity study and clinical trials, I wrote to Professor Whalley and thanked him for the facility he arranged for the required analyses. He immediately replied, saying 'This is a wonderful achievement and I congratulate you most sincerely. Final success comes at an appropriate time to provide a wonderful crown to your distinguished career. Our contribution was very small but we are pleased that we could help in this minor way.'[8]

Our close contacts continued as long as Professor Whalley lived. Since I changed from an experimental scientist to a science historian on my superannuation, I have made several visits to London during the succeeding two decades. Every time I was in London in search of source material I informed him. Invariably he asked me to wait in the lobby of the Russell Hotel in Russell Square. He joined there and took me for lunch at his favourite Italian restaurant nearby.

At our lunchtime meeting in August 1988, when I was starting on my research on pharmaceutical history, I shared my thoughts with Professor Whalley. He arranged a meeting with Raymond Dickinson who at the time was Deputy Secretary of the RPSGB and Secretary of the Commonwealth Pharmaceutical Association. A couple of days later, I had detailed discussions with Dickinson. He tried to explore the possibility of arranging funds from the Commonwealth Foundation, London, for my spending two years doing research in and around London, and wrote to the Deputy Director of the Foundation. Though the support did not come through I much appreciated the initiative taken by Professor Whalley and Dickinson. During my visit to London in May 2002, when I tried to contact Professor Whalley, Mrs Whalley told me that the professor was in a serious state. Although I was in London on 30 May I only found out about his demise when I was back home.

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Counter prescribing, Victorian seaside pharmacies, and popular history

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Introduction

In 1886, physician Horace Dobell wrote:[1]

> Asthmatic patients often recount the unnecessary sufferings they have undergone through being seized with a paroxysm of asthma while at some country place, and, finding themselves run out of their usual remedy, they have been obliged to get some at the first drug-shop that could be found—and it has proved inert. The delicate vegetable anti-spasmodics used by asthmatics, require to be in the finest condition or they are useless. ...
>
> For [many] reasons that will suggest themselves to medical men and patients, it is an essential condition of a health station that the chemists should be of the first class, and the place sufficiently populous to enable them to keep all the requirements of illness fresh and in proper variety.
>
> Bournemouth is singularly well off in this respect ... Much of the credit of this is undoubtedly due to Mr. Duncan [the 'senior chemist and druggist' there] for having placed the standard of the mode in which a chemist's business should be conducted so high that no one who did not follow his example had any chance of success.

These comments, from a book encouraging invalids to visit the seaside town of Bournemouth on England's south coast, hint at concerns surrounding retail pharmacy during Queen Victoria's reign (1837-1901). Amid nineteenth-century efforts to improve pharmacy's image as an educated profession, rather than as a trade, it was not hard for the public to suspect (i) the variable quality from shop to shop of medicines (dispensed and over-the-counter), and (ii) the unevenness in the widespread counter practice by chemists, that is the advice given and the prescribing of medications.

My two purposes are, first, to suggest that Victorian counter practice has not been given sufficient attention by historians even though it was undoubtedly an important facet of professional advancement.[2] In commenting on selected services at seaside resorts, I suggest that customers valued quality counter practice that demanded knowledge, time and an awareness of the special needs of customers and their illnesses. From this, my second purpose is to comment on the 2010 television series, and its companion book, on *Victorian Pharmacy*.

I. Counter practice

Introductory comments

First, before some specific examples, the following brief overview is intended to notice some key issues. With an increasing number of chemists' shops heightening competition during the 1800s, the development of a coherent pharmacy profession was tortuous. As is well known, challenges existed in dealing with differing views on how to improve educational standards, especially in science, and to establish general acceptance of standards of professional integrity.[3] A major challenge was that until the National Insurance Act of 1911, which was to create a new era for pharmacy, most chemists faced limited dispensing, for general practitioners commonly dispensed their own prescriptions.[4] In 1866, one chemist complained that he had only 'copied 323 prescriptions in sixteen years'. He added that, when apprenticed to the leading business in a small country town, he believed they 'did not average more than three or four prescriptions weekly, and had the business been confined to drugs' he did not suppose it would have been 'worth carrying on.'[5]

Amidst this, ethical tensions abounded as many business-minded chemists reacted strongly to any potential change or 'reform' in the *laissez-faire* business atmosphere that allowed many to make a living. As Dobell recognised, a diversity of chemists existed. How many sold products mindful of profit, rather than on the basis of what evidence they had of effectiveness? How many merely embraced the public trappings of professionalism as part of business entrepreneurship, perhaps merely adding 'Chemist by Examination' to their shop fascias?

And, how many ignored exhortations, such as from the pharmacy reformer Jacob Bell, to limit the boundaries of counter advice and prescribing, bearing in mind that the practice had much social value in filling a gap created by apothecaries when, as they transitioned to general practitioners, closed their 'open' shops except for medical consultations and the dispensing of medicines for their patients? What does seem clear is that the variable competence among chemists likely fostered a festering sore between themselves and doctors. Strong language was everywhere. During 1899, for instance, one physician wrote to the *British Medical Journal* that counter prescribing was a great and growing evil, while another wrote:[6]

> Counter prescribing, which you so strongly condemn in the British Medical Journal of May 6th, is beyond doubt fraught with danger to the public, discredit to the prescribing chemist, and herein perhaps lies the sting of the offence, loss of profit to the medical profession.

The writer then bemoans the lack of accepted scopes of practice – home visits to patients by chemists was one issue – while he over-optimistically suggested that, if physicians gave up dispensing their own prescriptions, chemists 'would probably be glad enough to abandon counter prescribing as their share of the bargain'.[7] As background to this, I suspect strong feelings between physicians and chemists intensified during the last decades of the century with the advent of new potent medications and disinfectants such as chloral and carbolic acid. They added to existing concerns over the public's ease of access to poisons that accounted for many accidental, as well as intended, deaths, often from arsenic and strychnine.

Typical of the confrontations was a 'Weymouth Mystery', which was reported, with overtones of condemnation, in the *British Medical Journal*.[8] In 1877, a chemist had prescribed and dispensed a draught of 'forty minims of laudanum and twenty grains of chloral'

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for a commercial traveller, likely an alcoholic. The morning after taking the draught, the traveller was found dead in his Weymouth hotel room. The jury at the coroner's inquest – it had to deal with disagreements over both post mortem findings and the effects of the prescribed draught on the salesman – returned a verdict that death was not occasioned, but accelerated, by the medicine. Perhaps the further finding that the chemist did not act with 'gross and culpable negligence' reflected not only the conflicting evidence, but also recognition that medicines containing antimony, arsenic, mercury and strychnine were commonly taken without ill-effects. After all, advice on appropriate dosages was widely available.

Unfortunately, we have no real sense of the level of negligence among chemists, nor do we know how many, especially in the provinces, gained the respect given to Bournemouth's Mr. Duncan (opening quote). Little study exists on the scope and quality of counter practice among chemists beyond suggestions of much variability. Here I can only offer pointers to a couple of features, untempered enthusiasm and diligent practice, although many other shades existed in between. Two examples of youthful exuberance come from the 1840s. The chief delight of Edward Frankland, as an apprentice in the 1840s in Lancaster, was in 'drawing people's teeth' whenever he had a chance, and prescribing for patients, whom, he said, seemed to have more confidence in him than 'in any of the duly qualified practitioners in the town'. He added, 'I never heard that I did any harm, but many grateful people came to tell me of the cures I had effected.'[9]

Another example is when twenty-three year old chemist John Young, in 1843, seemingly acted on first impressions when he immediately 'diagnosed' 'a spasmodic affection' in his father when finding him in great agony. Young quickly 'ran down to [his] shop and mixed a draught of aether, Laudanum and Magnes Carb', which he administered. At least the doctor, when called, concurred with the prescription.[10]

In contrast, *diligent* 'counter service' is documented for the turn of the century in a letter book of London chemist, Walter Gulliver. Amid much advice to customers on dosage and usage, he wrote to a correspondent in Cornwall on a relatively minor problem of insect bites: 'I am sending you some Lotion & Oil of Lavender to apply to the little girl. The Oil of Lavender is to prevent bites and should be applied just by touching the forehead and hands and other parts with the cork just moistened with it.'[11] Another time he recommended to the same customer, 'Strong Solution of Ammonia' as the best thing for 'bites' of insects, 'touching the centre of the bite with the liquid'. Undoubtedly, however, at times Gulliver dealt with more worried patients, perhaps those waiting for the results of a urine analysis he had performed. One can sense that Gulliver met high professional standards in assiduously looking after his customers. Perhaps he appreciated that taking into account their worries, amid a bewildering range of treatment options, was very much part of the 'art' of health care, or, to use a modern term, a therapeutic relationship.

In offering some suggestions about the breadth of knowledge and approaches needed for conscientious service, I look at three relatively mundane conditions taken to seaside chemists. If my suggestions about the scope of potential topics to be raised between customer and chemist seem unrealistically high, I have in mind the 'first-class' chemist, the popular and professional knowledge available at the time, and the appreciation, even if then being diluted, that treatment was to be individualised. Much of it is the sort of information likely acquired incidentally during an apprenticeship rather than the science classroom, as was an understanding of people and their illnesses.

Counter practice at the seaside

> Summer is a harvest to many [chemist] retailers, those in watering-places and holiday resorts especially

observed the editor of *Pharmaceutical Formulas* in 1908.[12] Although, Victorian seaside chemists responded to the same ailments as elsewhere, they expected queries over sea sickness, bedbugs, and sunburn. These are not only typical of countless, relatively minor situations dealt with by chemists, but which also serve as a reminder that there is more to Victorian pharmacy than the sales of poisons and narcotics that get so much attention by historians. 13

First, a brief reminder of seaside towns as health care resorts to provide context to my opening quote. Many emerged around the mid-1700s onward, in part because of the perceived benefits of sea-water bathing and sea air for both specific ailments and, more generally, to impart 'vigour' to infirm constitutions.[14] In 1843, the Sunderland chemist John Young wrote:[15]

> all the medicine prescribed by my medical attendants was simply tonics and purgatives. Judicious and careful exercise, with seabathing, were my grand restoratives.

Two years earlier, in his exhaustive *Spas of England and Principal Sea-Bathing Places*, A B Granville made clear the many services needed by invalids in health resorts. Although he did not mention chemists, as Dobell did later on, they already had a key role in supplying medicines, 'sick-room' supplies (maybe invalid foods and inhalers), and advice if a doctor was not immediately available. Clearly, too, even after the resorts transitioned from health to primarily holiday resorts, whenever convalescents and other visitors staying in hotels, boarding houses, and lodgings asked about a chemist, a local reputation was of prime significance.

Sea sickness

Sea sickness during Victoria's reign affected countless sufferers as day trips, ferry services, coastal excursions and sea voyages (not to mention railways and motion sickness) became part of the social fabric. Some evidence for this comes from the innumerable humorous postcards from the early 1900s that still reflected Victorian experiences and unpleasant memories of sea sickness. Senders described unhappy trips, although 'Fred', who felt much better after his stay in the Isle of Man in 1907, presumably escaped the rough seas between Liverpool and the Isle of Man shown on a card he sent — one of Louis Wain's popular drawings of cats (this

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time Manx cats) with their human expressions and behaviour (**Fig. 1**).

Figure 1.

On other cards, passengers are shown sick in their bunks, but mostly on deck with such captions as 'Everything going out nothing coming in', 'Rising to the occasion', and 'Hey up! It's coming', even losing false teeth (**Fig. 2**, 1933).

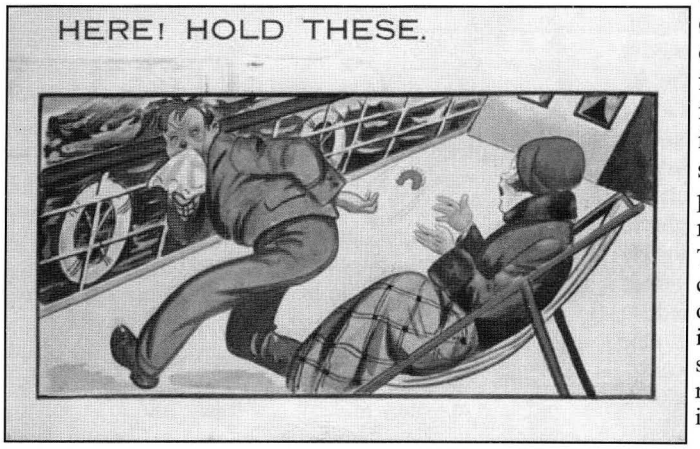

Figure 2.

Perhaps such passengers had ignored, or had not benefited from, the common advice to lie in a recumbent position, perhaps in a hammock, in the open air. In fact, a chemist, when offering advice, had to negotiate diverse theories and advice for prevention and treatment. The stomach, liver, nervous system, cerebral anaemia, and endolymph were all invoked in theories on the aetiology of seasickness.[16] Depending on the nature of the trip and how much a customer had read or heard, a chemist might be asked about diet and meals in preparation for an excursion to the seaside, or of the value of common household panaceas such as chicken broth, beef tea, and brandy to relieve nausea. And chemists, who were not entirely consumed by profits, might just find themselves discussing traditional folk/home remedies that ranged from drinking bilge or sea water to calming the stomach with, say, ginger or effervescent salts.

In contrast, popular and professional articles and books encouraged temptations to sell (as perhaps did customer requests) profitable seasickness remedies, even a spinal ice bag to contain ice for applying to the back (**Fig. 3**).[17] In the 1852 edition of his *A Compendium of Domestic Medicine*, John Savory (associated with the chemists Savory and Moore), wrote that for 'nausea, or tendency to vomit', which varied in different persons, one could use 'camphorated spirit, sal volatile, and Hoffman's ether' administered 'in water or on a small lump of sugar – remedies that, he said, had 'frequently afforded more relief' than others.[18] However, later in his 1886 edition, following standard medical textbooks, he also noted some 'modern' remedies, namely, nitroglycerine and nitrite of amyl (they 'should only be used under medical advice') and cocaine. A long list of new remedies emerged so that, seemingly, any new preparation promoted by at least one 'authority' found its way into standard accounts.[19] In 1907 it was observed: 'Half the drugs of the pharmacopoeia are ordered one after another by the same authors, evidently in the hope that one will hit the mark'.[20] The conscientious chemist ought to have made clear that a sense of trial and error existed.

Surprisingly, Savory did not mention sedatives, especially bromides, which, prescribed by physicians and chemists, were being favoured during the last decades of the 1800s. The advice in one book on sea sickness for administering powders of potassium bromide is intriguingly detailed, a reminder that the level of information chemists gave with over-the-counter sales, and with prescriptions (their own and physicians') could contribute much to a therapeutic relationship:[21]

> These powders are best taken in a half-tumbler of carbonic-acid water (ordinarily called soda water), or, if this cannot be obtained, in a half tumbler of iced sugar-and-water. This should be sipped down slowly, so that the stomach may be persuaded to retain and absorb it. ... The powders should be kept in a tin box, or in a wide-mouthed phial.

Among the many over-the-counter choices of seasickness remedies were a number that must have raised, for some chemists at least, ethical questions over profits. One must wonder whether Heppell & Co., the fashionable London chemists, reflected a common economic practice of promoting a single over-the-counter remedy. In 1912, part of its permanent window

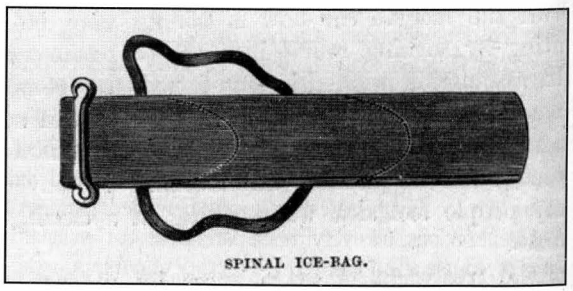

Figure 3.

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advertising in all four of their shops prominently promoted 'Delphinine,' a potent alkaloid that, seemingly, had only a modest reputation for treating seasickness. [22]

The bedbug saga

The following brief remarks on bedbugs also underscore an intractable problem that, even more than seasickness, could dent the success of a holiday or health trip. Beatrix Potter, when staying at the Osborne Hotel in Torquay in 1893 was frustrated by 'too much Natural History in a bed'. She reported:[23]

> I did not undress after the first night, but I was obliged to lie on it because there were only two chairs and one of them was broken. It was very uncomfortable to sleep with Keatings in the hair. What is to be thought of people who recommend near relations to an Hotel where there are bugs?'

The 1890s or so were a time when the increasing numbers of seaside holiday visitors, housed in a diversity of accommodations, compounded meetings with bedbugs and fleas.

Humorous stories of the time underscore the widespread problem. As reported in *The Sporting Times* in 1900 comedian Harry Byron, renowned for quick repartee, was putting on his trousers when he saw a 'fat and plethoric common, or Margate, bedbug'. After killing it, he mourned: 'poor fool if you'd gone down the brown stripe you'd never have been seen!'[24]

Innumerable early 1900 humorous postcards also testify that the 'little beasts' remained commonplace at seaside resorts, sometimes specifically mentioned in a card's caption. One, stating 'Having a lively time. Come and join us in the sport at Blackpool', depicts three men hunting and swatting bedbugs.[25] (**Fig. 4**, c. 1908).

Figure 4.

And British class issues are reflected on a card from Morecambe captioned: 'Big Bugs at Morecambe?' A man sitting up in bed muses, 'I can't sleep for thinking of 'em' – a double entendre, for big bugs also referred to persons who assume their own importance.

A diversity of advice and treatments existed. Amid countless 'insect' powders, the best known was undoubtedly Keating's Powder, widely advertised even on the sides of seaside bathing machines.[26] Many people, presumably including Beatrix Potter, packed Keating's as a travel item. After all, it was also used to kill fleas and cockroaches, etc. The main ingredient in Keating's, as probably in many other proprietary insect powders, was well known to be 'Persian insect powder', the flowers of 'Pyrethrum rosaceum' (*Chrysanthemum coccineum*). While chemists must have reaped a profitable mark-up from Keating's, one wonders how many drew customers attention to the fact that they also sold the Persian Insect powder at a cheaper price, and that it was just as effective despite the massive Keating advertising.[27]

If Persian insect powder had a reputation for a quick 'knock-out, 'exterminating bugs from nooks and crannies in bedrooms' and elsewhere was a different matter – as difficult then as now, both times without DDT.[28] One wonders what Victorian chemists advised? Maybe the more conscientious gave some general advice before trying to sell a product, maybe discussing the value of iron bedsteads, whether flock bedding was the best, and perhaps even thoughts about bug traps. One trap, for instance, consisted of placing under a mattress a piece of soft wood with a series of holes bored into it; periodically the trap, hopefully containing bugs that had hidden there, was placed in hot water.[29] Discussion about fumigating rooms might be called for, maybe whether to try sulphur as generally used in a room vacated by an infectious disease patient. Perhaps this led to consideration of how long bedbugs could survive without a blood meal, or even whether bugs could transmit disease.[30]

Customers might arrive with their own questions about a formula they had read about. *The Young Folks Paper* for July 20, 1889, amid a list of 'Ten Good Things to Know' included as number 7: 'blue ointment and kerosene, mixed in equal proportions and applied to the bedsteads, is an unfailing bedbug remedy.'[31] There were, too, questions about the effectiveness of general 'bug poisons' that commonly contained mercury (mostly corrosive sublimate) or some form of arsenic, although others might have turpentine and camphor, or 'Scotch snuff' with soft soap.[32]

Advice was commonly wanted on how to treat the bites. Gulliver's recommendation, noted above, for ammonia was commonplace; John Savory, for one, stated:[33]

> Ammonia is the best application, of which eau de luce, is a convenient form. The ordinary solution of ammonia and sal volatile are equally available'.

Other alternatives for discussion included the local anaesthetic action of cocaine, while, for warding off insects, many choices existed, most containing essential oils. [34]

Sunburn

It can be hard to believe that sunburn was an issue at the Victorian seaside and into Edwardian times when one looks at, say, innumerable postcard views showing promenades full of women in long dresses, carrying parasols, and men fully suited and hatted.[35] On the other hand, faces and other parts of the body were exposed, even minimally, when paddling or bathing. The sender of

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a 1906 card from Morecambe wrote that 'we are all sunburnt ' and that 'the skin is peeling off Effie's face and she looks nearly black.' Perhaps Effie, like many other women, was worried about long term effects on her complexion. Such concerns, with sunburn as a major culprit, were reported as a 'main source of revenue' for many chemists as part of their 'summer harvest.'[36]

Advice from the conscientious chemist, even if not requested, might have included warnings about applying Vaseline to the face before going out into the sun, for it was reported blisters might then occur after sun exposure.[37] More likely help was given to customers to make choices among numerous complexion balms and sunburn washes to prevent and treat sunburn, perhaps suggestions based on a person's preferred scent. Questions might be asked about the widely-known Rowland's Kalydor, a soothing preparation for the skin, sometimes advertised for sunburn while specifically noting 'VISITORS TO THE SEASIDE AND OTHERS exposed to the Scorching RAYS of the SUN, and Heated Particles of DUST.' [38]

In summary, I hope my remarks have made the point that a critical aspect of the success of the 'first-class' Victorian chemist was conscientious customer care. It is unfortunate that, in being relatively undocumented, this tends to be lost amid the detailed history we have on dispensing and on the striving for greater professional standing through the efforts of the Pharmaceutical Society – after all, dispensing was a hidden mystery for the majority of customers. It is this issue that brings me to comment on the 2010 television series and companion book on Victorian Pharmacy.

II. 'Victorian Pharmacy'

Public relations

First let me say that the following remarks are prompted primarily by views that the entertaining series was considered to have been good public relations for present-day pharmacy. Under the heading 'Good TV great for pharmacy,' the Royal Pharmaceutical Society's Head of Communication stated enthusiastically: 39

> Having a BBC prime time TV series with the word 'pharmacy' in the title is not to be sniffed at. It achieved 'the media presence that pharmacists want to see'.

Moreover, it was clearly invaluable that the Museum of the Society was indispensable in supplying information, expertise and artefacts, but, of course, not how that was edited and used.[40]

But is all publicity constructive for a profession? How did the TV programmes, which were generally well received, affect public attitudes toward pharmacy? Unfortunately, so far as I know, no survey results are available to respond to this. Various reviews and blogs, however, hint that many people, aside from being entertained, gained little insight into the role of chemists in health care as a whole. One reviewer said:[41]

> Where [the programme] worked best was in delivering a social history of medicine, the lack of knowledge about how infections are transmitted, the growth of alternative therapies,' etc.

There were, too, what might be described as 'gee whiz' responses. One person noted that the series was a 'mild improvement' on a preceding one on the Victorian farm, because it was 'gorier'. This was presumably linked to the scenes of leeches, scarifiers, earthworms, a fireworks display, and an emphasis on the dangers of poisons. Perhaps this accounted for the sense of progress being translated into such misleading blog overstatements as 'pharmacy [being] a mix between quackery, witchcraft and guesswork' during the earliest years of Victoria's reign.[42] This writer seemingly overlooks the emphasis the series placed on the power of a patient's trust in a chemist, on the placebo action. On the other hand, as important as it was, and continues to be, it is easy to feel that the programme treats the placebo response dismissively in a rather arrogant way ('we now know better') as when using it to explain the success of ineffective cure-alls. No sense is provided of the medical and cultural context in which remedies were used, including the power of elegant dispensed products.

Popular history

In turning to the book, *Victorian Pharmacy*, which, with its many illustrations from the TV production, is both a souvenir and a history of Victorian pharmacy, I recognise that it is popular history, not to be viewed as a definitive and scholarly work; thus, for instance, the questionable amount of space given to topics such as leeches can be overlooked.[43] Nevertheless, even as a souvenir, should the book at least provide balanced background to the relatively fleeting 'messages' that come from entertaining television programmes? Given that the Victorian pharmacy programmes were labelled as 'historical documentary,' should there not be a reasonable attempt to indicate pharmacy's role in health care as a whole? Popular history inevitably has to simplify, but oversimplification can lead to seeing a misleading sense of inexorable progress, well reflected in the book's closing sentence?

> The [pharmacy] profession had matured [by 1900], and fluke remedies and quack potions were being replaced as new scientific understanding paved the way for inventions and products that actually worked. The Victorian pharmacist had come of age.

Of course there had been change and progress, but what is meant by 'matured' and 'come of age'? Much of the justification for the statement appears to be such 'substantial' medical advances as X-rays and the germ theory. Much emphasis is placed on the latter, which, as is well known, opened vastly new horizons in health care, but the immediate impact prompted many controversies and a diversity of doubtful products and uncertainties facing the every-day chemist. In fact, the historical context provided by the author for the story of Victorian retail pharmacy is not one of therapeutic approaches, but primarily one of the horrors of killer infectious diseases such as cholera, smallpox and typhoid, as well as public health measures; moreover, no clear indication is given as to how these affected or changed the everyday practice of retail pharmacy. The author does add:[44]

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> syphilis, cholera and TB were the day-to-day business of the pharmacist, chemist and druggist. And as if these alone were not enough, then measles, scarlet fever, whooping cough, polio and influenza all required careful treatments and could kill.

But what is meant by 'careful treatment?' And by whom?

In this regard, counter practice which, I have suggested, was a critical aspect of the successful Victorian pharmacy is given short shrift in the book, even with the chapter, '2000 items in stock.' One brief paragraph states that 'issues' of advice on health matters by 'unqualified chemists or pharmacists' was a 'thorny one.' Although Jacob Bell's public acceptance of some counter practice is noted, as is many people's financial inability 'to consult an apothecary or physician,' the topic is left in limbo.[45] Indeed, the chemist is portrayed solely as an entrepreneur, 'obligingly [selling to the public] whatever they requested,' and leaping 'with enthusiasm on any new product that might tickle the fancy of their customers'. [46]

Overall, the book misses an opportunity to show the singular place of retail pharmacy in Victorian health care or, for that matter, the social life of a community. Granted, given the attention over the years to antique pharmacies and dispensing tools and containers, it is easy to view the Victorian pharmacy as merely an interesting shop and place to compound medicines, and to leave as footnotes such less glamorous Victorian educational and legislative efforts.

Starting with my belief that extensive counter practice/prescribing, with all its warts, was central to a Victorian chemist's professional role in health care, I have raised some of my concerns about a public presentation of pharmacy that is very limited in scope. It is, too, a presentation that, despite a claim of 'rediscovering forgotten remedies and recipes' offers no sense of the nature of Victorian therapeutic approaches. Of course, it is difficult to select topics for any book, never mind popular histories, but pharmacy's *professional* bodies, in supporting the history of pharmacy as public relations, should ensure the history at least pays attention to pharmacy's complex roles with customers/patients, as well as the many internal and external professional problems that it has to face.[47] Just as the professional bodies demand 'evidence-based' data for drug information, so surely they should rely on accepted standards of historical research when promoting history as public relations or to educate the public about pharmacy.

Although it is often said that if no harm is done, then any publicity is good publicity, this can too readily overlook the way popular history leaves the sense of inexorable progress I have mentioned; in turn, this can foster notions of superiority ('we know best') that lead us to forget that uncertainties, frauds and foolishness in health care are still with us. Actively supporting overly simplified interpretations gives a skewed sense of change and progress that hinders searching questions both from outside and within the profession, about past and present health care.

Addendum: a missed opportunity?

To add substance to my closing comments, I add a speculation on whether a failure to ask searching questions led to a lack of debate on the consequences of a change in counter practice following the 1911 National Insurance Act. I noted earlier that the Act initiated a new era, which in essence marked the end of Victorian pharmacy. *The Pharmaceutical Journal* stated in 1914:[48]

> The lost art of pharmacy is reviving under the kindly influence of the National Insurance Act.

This, a sense of progress, referred to the radical increase in the volume of dispensing, which was a major if not total victory over doctors. Ignored, however, were the implications for chemists' counter-prescribing. No serious questions seem to have been raised over what turned out to be a victory for physicians, namely a change in the direction of counter-prescribing. This became much more limited in scope, albeit not insignificant, not only as chemists paid greater attention to dispensing, but also as physicians became less concerned over loss of income as they assumed more and more gatekeeping roles, and as poison and narcotic controls strengthened.[49]

One reason for raising this is its pertinence to the current opinions that pharmacy has now entered a new era, namely a change 'from a product base to a patient-focused one'.[50] However, arguably, the new 'clinical' pharmacy – a rebirth, albeit adapted, of counter practice of the past – is subservient, even with input from pharmacy, to medically controlled clinical data summarised into meta-analyses, systematic reviews, consensus statements, guidelines, and computer data bases that essentially establish accepted uses and side-effects. In the hands of many pharmacists and physicians such information, when translated into patient handouts, short circuits the skills and knowledge needed for the empathetic individual care of worried patient/customers.

Thus questions arise whether pharmacists as drug 'experts,' now often caged behind glass windows and away from customers and over-the-counter medicines, have forgone customer skills that had been essential for success during and since the Victorian times. Becoming 'scientific' experts on drugs was a laudable way to deal with boundary issues with medicine, but how well did it serve the public as a whole? Did not pharmacy, following the euphoria of the 1911 Act, fail to recognise and hence build into its educational programmes the clinically-oriented counter advice/prescribing of Victorian times? A belief that an occasional social science course in today's pharmacy schools is sufficient to develop necessary humanistic skills needs close examination and open debate that I do not see happening. 51

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Endnotes and References

1. Dobell H. *The Medical Aspects of Bournemouth and its Surroundings*. London: Smith, Elder, 1886, pp, 162 and 164. Henceforth, in this presentation 'chemist' is used for

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chemist and druggist, druggist, and pharmaceutical chemist, except when quotes use the other terms.

2. Various writings comment on counter practice, especially prescribing, but a comprehensive account of the boundaries and scopes of practice that have shaped relationships between medicine and pharmacy is wanting. For some introductions: Holloway SWF notices issues in various places in his *Royal Pharmaceutical Society of Great Britain 1841-1991: A Political and Social History.* London: Pharmaceutical Press, 1991. Marland, H. The 'Doctor's Shop': The Rise of the Chemist and Druggist in Nineteenth-Century Manufacturing Districts. In Curth LH (ed.) *From Physick to Pharmacology. Five Hundred Years of British Drug Retailing.* Aldershot: Ashgate, 2006, pp. 79-104. The present author looked at a number of issues surrounding counter practice during the early decades of efforts to improve professional standing: Crellin JK. Revisiting Counter Practice amid Pharmacy and Medical Reform in 19th-century Britain. *Pharmaceutical Historian* 2000; 30(3): 44-49. Homan P. The Development of Community Pharmacy. In Anderson S (ed.) *Making Medicines*. London: Pharmaceutical Press, 2005, pp. 115-134.

3. For a relevant survey indicating some of the complexity of the situation, Holloway, SWF. Professional Business: the Achievements of the Royal Pharmaceutical Society since 1841. *Pharmaceutical Journal* 2000; 264: 15-21. Pertinent points are also made in terms of moral character and science in Malleck DJ. Professionalism and the Boundaries of Control: Pharmacists, Physicians and Dangerous Substances in Canada, 1840-1908. *Medical History* 2004; 48: 175-198. (It is appropriate to add that among founders of the professional movement, such as Jacob Bell, moral integrity centred on Quaker values.)

4. Quoted in Hunt J. 15th January 1913 – the Day Pharmacy Entered a New Era. *Pharmaceutical Historian* 2001; 31(1): 10-12. The Act limited the dispensing of national insurance prescriptions to chemists.

5. *Pharmaceutical Journal and Transactions* 1866-67; 8: 292. Quoted from Crellin JK. Pharmacies as General Stores in the 19th Century. *Pharmaceutical Historian* 1979; 9(1): 5-6. One assumes that the number did not include family receipts commonly taken to chemists.

6. First letter: Cunliffe B. The Pharmacy Bill and Counter Prescribing. *British Medical Journal* 1899; (i): 1192; the second, ibid., 1192-1193.

7. For a complaint of chemists visiting patients: letter to *British Medical Journal* from 'Honour without profit,' *British Medical Journal*, 1893; ii: 868.

8. *British Medical Journal*. 1877; ii: 634-635.

9. Quoted in Holloway (note 2).

10. Milburn GE (ed.) The Diary of John Young Sunderland Chemist and Methodist Lay Preacher covering the years 1841-1843. *The Publications of the Surtees Society* 1982; 195: 101.

11. Roberts DA. 'Mr Gulliver's Letter Book. A Belgravia Pharmacy One Hundred years Ago,' *Pharmaceutical Historian* 2000; 30(1): 6-19.

12. MacEwan P. *Pharmaceutical Formulas*. London: Chemist and Druggist, 1908, p. 50, echoing earlier editions, the first in 1898. The focus was mainly on 'the complexion' see below.

13. The emphasis can lead the general reader to view the provision of poisons and narcotics as central to Victorian pharmacy. For instance, recently the book *Victorian Pharmacy* (see below), and a symposium hosted by the Wellcome Collection, London, 11-12 February, 2011, titled 'High Society: Drugs in Victorian Britain,' (see http://www.wellcomecollection.org/whats-on/events/drugs-in-victorian-britain/about-our-symposia.aspx Accessed January 2011.

14. For reference to vigour, Granville AB. *Spas of England and Principal Sea-Bathing Places*. London: Colburn, vol. 1, 1841, p. 183.

15. Milburn (note 10), p. 88.

16. Among the various medical and other texts indicating the many theories, the following are especially noteworthy: Partsch H. *Sea-Sickness. A Comprehensive Treatise for Practical Use*. Boston: Cupples, 1890; Barnett HN. *Sea-Sickness. Its True Cause and Cure*. London: Baillière, Tindall & Cox, 1907.

17. For enthusiastic promotion and detail on use of the spinal ice bag, which seemingly had a long life, Anon. *The Family Physician. A Manual of Domestic Medicine.* London: Cassell, n.d. (c. 1905), vol. 2, pp. 363-365.

18. Savory J. *A Compendiun of Domestic Medicine: and Companion to the Medicine Chest*. London: Churchill, 1852, p. 231.

19. Savory J. *A Compendium of Domestic Medicine and Companion to the Medicine Chest*. London: Lewis, 1886, p. 261. Savory's list was in keeping with information in standard medical textbooks such as Hare RA. *A Textbook of Practical Therapeutics.* Philadelphia: Lea Brothers, p. 109: 'bromides both for prevention and treatment (chloralamide and potassium bromide claimed to have extraordinary results).' And Ringer S and Sainsbury H. *A Handbook of Therapeutics.* New York: Wood, 1897, noted (different pages), the following as having been recommended: bromides, chloral, chloramide, chloroform, cocaine, nitrite of amyl, nitroglycerine, and spinal ice bag.

20. Barnett (note 16), pp. 27–28.

21. Barker F. *On Sea-Sickness.* New York: Appleton, 1870, p. 34.

22. For photographs of the Heppell stores, Tallis N and Arnold-Foster K. *Pharmacy History. A Pictorial Record. Photographs from the Museum of the Royal Pharmaceutical Society of Great Britain.* London: Pharmaceutical Press, 1991, pp. 55-60. I have not been able to research the history of the company to determine its special interest in delphinine. Among other examples of products to be questioned is 'Derbyshire's Patent Embrocation for Preventing Sea-Sickness, a formula for which was given in Beasley H. *The Druggist's General Receipt Book.* London: Churchill, 1895, 10th edition, p. 176.

23. Linder L (transcriber). *The Journal of Beatrix Potter from 1881-1897*. London: Frederick Warne, 1966, p. 307. (For reference to B flats, p. 193).

24. *The Sporting Times* May 12, 1901, p. 1.

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25. It is noteworthy that two or more men are often sharing the room with the bugs, a reflection of times when travelling salesmen looked to reduce costs.
26. For reference to bathing machine advertisements for Keating's Powder, see Howell S. *The Seaside*. London: Studio Vista, 1974, p. 131; for Advertisements for Keating's Powder *Illustrated London News* August 13, 1904, p. 248; and ibid., May 14, 1910, p. 2 (also notes beetles).
27. In 1875, a Dr Reid reported that he had found Keating's effective for fleas 'beyond his expectations,' but found Persian insect powder cheaper, *British Medical Journal* 1878; ii: 683.
28. As is still appreciated, bedbugs can be difficult to eliminate from the many crevices they inhabit. A returning bedbug problem in 2009 was described as a growing nightmare. The resurgence is linked to the banning of many effective pesticides notably DDT that, after it was widely used during World War II, did much to control bedbugs and other insects. (For quote, Cappiello D. 'Yikes, bedbugs! EPA looks to stop resurgence'. http://www.physorg.com/news158927415.html Accessed September 2009.) Although not implicated in the transmission of any disease, reports exist of infections at the site of a bedbug bite and allergic reactions.
29. Poole GK. Letter. Bugs. *British Medical Journal* 1877; i: 736.
30. For a sense of the concern: The Survival of Bed Bugs. *British Medical Journal* 1910; i: 1092.
31. *The Young Folks Paper* July 20 1889, p. 38.
32. For non-mercurial formulae (and others), Beasley (note 22), p. 331. However, maybe bug poisons were unavailable in some chemist's shops, since it was still being reported in 1908 that they did 'not yet rank as a leading 'profitable extra,' because few if any chemists have had the courage to make them a counter-specialty.' MacEwan (note 12), p. 388.
33. Savory, 1886 (note 19), p. 204
34. For cocaine and essential oil suggestions, MacEwan (note 12), p. 53.
35. For example a scene c. 1906, 'In Season' on the Lees, Folkestone. The sender, however, did ask for his 'bathing drawers' to be sent to him.
36. MacEwan (note 12), p. 50.
37. MacEwan (note 12), pp. 50-51 for sunburn advice.
38. Advertised in a serial issue of Charles Dickens', *Our Mutual Friend*, Number 4, 1865. See http://dickens.ucsc.edu/OMF/serial/serial.html Accessed March 2011.
39. Patel, N. *Pharmacy Professional* 2010 July/August: 24. And the Director for England at the Royal Pharmaceutical Society noted that, in his view, the series 'would not have been made without the expert knowledge that resides at RPS.' (Duff, H. *Pharmaceutical Journal* 2010, 285; 465). There was also a build-up of the series for pharmacists: Hudson, B. What did the Victorians do for us? *Pharmaceutical Journal* 2010; 285: 63.
40. For role of the Museum, Hudson B. Checking the History. *Pharmacy Professional* 2010; July/August: 22-23.
41. Crace J. *The Guardian*, 16 July 2010. See also Whitelaw P. *The Scotsman*, 17 July 2010; *Leicester Mercury* 16 July 2010.
42. Hoseason R. Amazon.co.uk Reviews of DVD of Victorian Pharmacy http://www.amazon.co.uk/product-reviews/B003U6PIHQ/ref=cm_cr_pr_fltrmsg?ie=UTF8&showViewpoints=0 Accessed August 2011.
43. Eastoe, J. *Victorian Pharmacy: Rediscovering Forgotten Remedies and Recipes*, London: Pavilion, 2010. The book is much less, despite the subtitle, a rediscovery of 'forgotten remedies and recipes'. Although there is a considerable amount of information on recipes and products, the former, often without essential details, are scattered indiscriminately throughout the text, generally without context to understand their nature and the *secundum artem* often needed in their preparation. The indiscriminate nature of the recipes is also reflected in the many that are referenced as 'old herbal remedy, source unknown' with no indication of a how they are relevant to the story of nineteenth-century pharmacy.
44. Eastoe (note 43), p. 66.
45. Ibid., p. 73.
46. Ibid, p. 72.
47. It is perhaps noteworthy that a review of the book in the *Pharmaceutical Journal* by a former deputy editor of the Journal offered no historical appraisal. (See *Pharmaceutical Journal* 2010; 285: 448. Unfortunately, the book gives no clear sense of the issues in health care such as tensions with the medical profession over counter prescribing, the diverse attitudes among chemists and druggists toward professionalism, or even of the problematic issues occasioned by Jesse Boots, despite a section in the book on 'Herbalism and the Origin of Boots the Chemists.' In fact, the author seemingly reflects a particular interest in herbalism without any indication of how the diverse concepts within it, or different ways of preparing herbs, impacted directly and indirectly on pharmacy.
48. Quoted in Hunt (note 4).
49. For some indications of continuing counter practice into the twentieth century, Anderson S. Community Pharmacy in Great Britain: Mediation at the boundary between professional and lay care 1920-1995. In Gijswit-Hofstra M, Van Heteren GM and Tansy EM (eds). *Biographies of Remedies*. Amsterdam: Rodopi, 2002, pp. 75-98.
50. This is implicit in a recent history, albeit in the USA: Elenbaas RM and Worthen DB. *Clinical Pharmacy in the United States: Transformation of a Profession*. Lenexa: American College Clinical Pharmacy, 2009 (p. 175 for one specific quote). No sense is given of the early role of counter prescribing.
51. The lack of attention to history of pharmacy and the humanities in pharmaceutical education has often been decried, recently by Anderson S. Future Pharmacists: past imperfect, present tense, tomorrow uncertain. *Pharmaceutical Journal* 2011; 286: 162. For one recent view, Low AJT. The Importance of Human Contact. *Pharmaceutical Journal* 2011; 286: 165.

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Book Review

Pharmaceutical History of India

Prof. Harkishan Singh

Delhi, India: Vallabh Prakashan, 2011, pp.322 (hardback price Rs 630, £9.99).

Over the last few years Harkishan Singh has authored an impressive range of publications on the history of pharmacy in India, with no fewer than seven books on the subject along with compilations of his other contributions. His early books covered the history of pharmacopoeias and formularies, pharmacy education and pharmacy practice, whilst his most recent publications have been biographies of those who shaped pharmacy in India during the twentieth century.

This new book brings together in a single volume material largely drawn from the previous ones. However there is considerable useful new material here too, and some important themes have been expanded upon. Thus there are now separate chapters on the Drugs Enquiry Committee of 1930-31, on the Health Survey and Development Committee of 1943, and on the development of drugs and pharmacy statutes. There are also short separate chapters on how pharmacy ethics, rural pharmacy and hospital pharmacy developed in India.

Singh has also taken the opportunity to update material in a number of areas. Thus the chapter on education for pharmacy practice now mentions the introduction of the PharmD programme, introduced in the academic session 2008-09; and the chapter on postgraduate studies and research covers the introduction of the Graduate Pharmacy Aptitude Test (GPAT) from session 2010-11. There is also a greater emphasis in this book on the history of pharmacy in India post-independence in 1947. For example, it includes an account of the development of the *Indian Pharmacopoeia* of 2007.

This new material is very welcome, as is an entirely new chapter on the pharmaceutical industry. Here Singh gives us a useful introduction to the rise of the industry in India, an important area not covered in his earlier volumes. However there is an unfortunate shortcoming in this and others chapters that provide new material. His earlier volumes are exemplary for their detailed and comprehensive referencing, allowing other historians to refer back to his original sources. But in this book Singh has omitted references in order to save space and pages. Whilst this is understandable and perfectly reasonable for material drawn from his earlier works, it is a serious omission for the new material. Hopefully this will be rectified at some future date.

Although brief biographies of key individuals (drawn from his series of four books on builders and awareness creators of modern pharmacy) are included, these represent a small proportion of the book's total length, being contained in a single chapter of less than thirty pages in a book of 322 pages. The supplementary readings, running to seven pages, list the contents pages of Singh's own works.

It is this last point that highlights one of the main flaws in Singh's work. Although his contribution has been great he is not alone in having written about the history of pharmacy in India. There is now a not insignificant historiography relating to this area; others have written about the history of pharmacy in India in books and learned journals, most often in the fields of the history of medicine, science or technology. There are also frequent pharmaceutical references to be found in the business histories of pharmaceutical companies, in histories of international trade and in histories of colonialism.

This is nevertheless another useful contribution from Professor Singh, and the book provides a good initial introduction to the history of pharmacy in India for those wishing to learn more about it. However, the challenge for future generations of historians of Indian pharmacy is to embed this and related material into the wider historiography of pharmacy, medicine and trade in India.

Stuart Anderson

Major Accessions to Repositories in 2010 Relating to Pharmacy and Chemistry

Local

Bedfordshire and Luton Archives Service, Riverside Building, Borough Hall, Cauldwell Street, Bedford MK42 9AP. Royal Pharmaceutical Society of Great Britain, Bedfordshire branch: papers 1923-73 (X963)

East Kent Archives Centre, Enterprise Business Park, Honeywood Road, Whitfield, Dover, Kent CT16 3EH. William Jenner & Co, pharmaceutical chemists, Sandgate: prescription register 1895-1903 (EK/U250)

Glamorgan Archives (formerly Glamorgan Record Office), Clos Parc Morgannwg, Leckwith, Cardiff, Glamorgan CF11 8AW. BA Davies, chemist, Rumney: prescription book, dangerous drugs register, cash book and VAT returns book 1951-88 (D747); Stanley Baldwin Edwards, pharmacist and dispensing chemist, Cadoxton-juxta-Barry: prescription register and account books 1921-1957 (D680)

Hertfordshire Archives and Local Studies, CHR002, County Hall, Pegs Lane, Hertford SG13 8EJ. Sidney Herbert Atkins, chemists, Stanstead Abbots: prescription books (2) 1922-1933 (Acc 4876)

Hull History Centre (Hull City Archives), Worship Street, Hull HU2 8BG. Pharmaceutical Society of Great Britain, Hull branch: records 1980-1991

Sheffield Archives, 52 Shoreham Street, Sheffield S1 4SP. Job Preston Ltd, chemists, Sheffield: general prescription books 1879-1892 (X439)

Special

Wellcome Library, Archives and Manuscripts Section, 183 Euston Road, London NW1 2BE. Cyril Keele, pharmacologist: papers incl notebook on experiments, ideas behind work on pain, with article c1945-1960 (Keele); H V Wyatt, molecular biologist: papers rel to career incl corresp and articles 1928-2000 (PP/HVW)

University

Cambridge University: Churchill Archives Centre, Churchill College, Storey's Way, Cambridge CB3 0DS. Sir Aaron Klug, chemist: scientific papers 20th cent (KLUG)

Strathclyde University Archives, Andersonian Library, 101 St James Road, Glasgow G4 0NS. John Baxter (Chemists) Ltd, Cambuslang: records c1920-1989 (Accession 1146)

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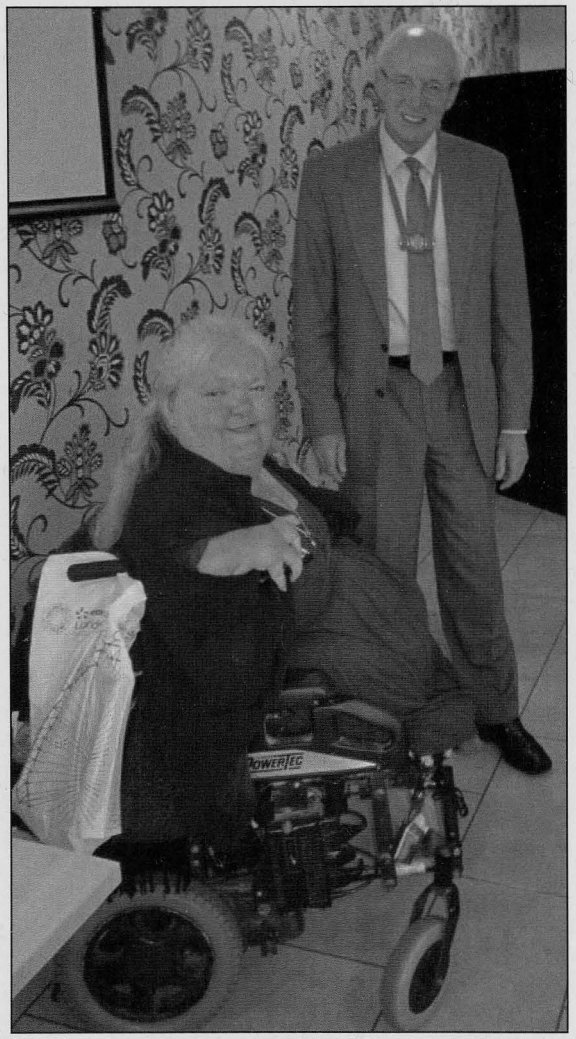
Thalidomide
Mrs Louise Medus-Mansell, who gave a talk on 'The History of Thalidomide' on 4 May 2011, with new President Trevor Whaley.

A Webex audio recording can be heard by following the link to:
https://rpsmc.webex.com/rpsmc/ldr.php?AT=pb&SP=MC&rID=11732687&rKey=C645065CEA1898A3 [no spaces].



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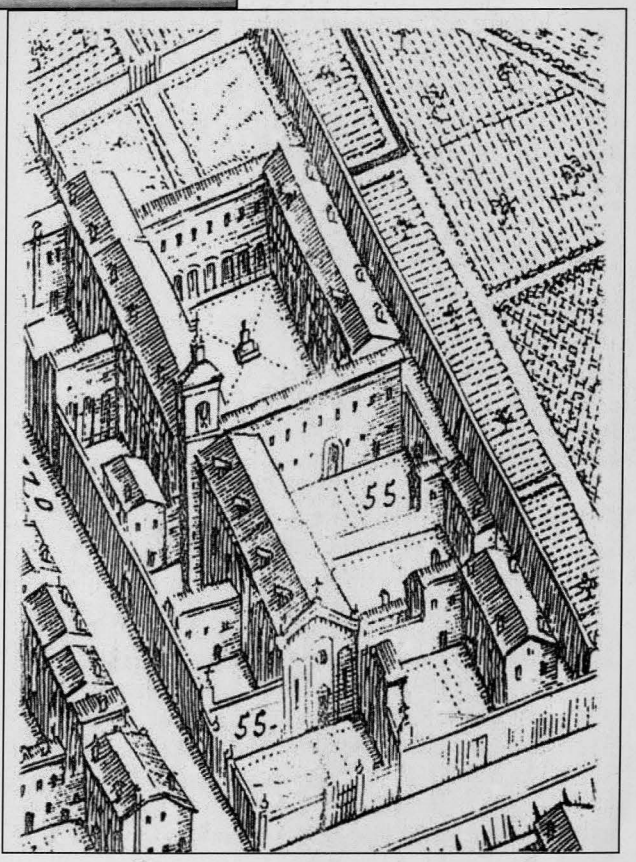

Cholera in 19th century Ferrara
Two further illustrations from Vicentini, Altieri and Manfredini, pp 34-41: *Above*, The 18th century Bragliani Pharmacy, University of Ferrara; *right*, S. Maria Grazie from Bolzoni's Plan of the City of Ferrara (Lombardy), 1747.

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Q House, Troon Way Business Centre, Humberstone
Lane, Thurmaston, LEICESTER LE4 9HA

Founded 1967

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British Society for the History of Pharmacy

Q House, Troon Way Business Centre, Humberstone Lane, Thurmaston, LEICESTER LE4 9HA
Tel: 0116 274 7355; Fax 0116 274 7365; Email: bshp@associactionhq.org.uk
Website: www.bshp.org

The British Society for the History of Pharmacy was formed in 1967 under the aegis of the Pharmaceutical Society of Great Britain, having originated from its History of Pharmacy Committee.

BSHP seeks to act as a focus for the development of all areas of the history of Pharmacy, from the works of the ancient apothecary to today's ever changing role of the community, hospital, wholesale or industrial pharmacist. Membership is open to all interested in the aims of BSHP.

Aims

Promotion of historical studies related to pharmacy.
Advancement of knowledge and propagation of understanding of the history of pharmacy.
Publication of the research work of pharmaceutical historians.
Preservation of pharmaceutical artefacts and historic pharmacies.
Support for the work of relevant museums and offering advice on establishment of other pharmaceutical exhibits and on the preservation of pharmacies.
Co-operation with related professions and local historians on medico-pharmaceutical topics of mutual interest.

Pharmaceutical Historian

The *Pharmaceutical Historian* has been published since 1967, at first intermittently, but on a regular quarterly basis from 1972. Issues generally comprise 16 or 20 pages and cover.
An **index** for the years 1967-1995 was published in 1998, for 1996-2000 in 2000, for 2001-2005 in December 2005 and for 2006-2010 in December 2010. They can be viewed on the website.
Papers, short communications and letters in English on any aspect of the history of pharmacy are welcome and should be sent to the address above or by email to *ainley.wade @easynet.co.uk*
Any illustrations are converted to monochrome for printing. Further details of requirements can be found on the website *www.bshp.org* under Publications.

Membership

Membership costs £20.00 per annum and includes:

Four issues of the *Pharmaceutical Historian.*

Regular meetings, with guest speakers, usually in November, February and May.

Visits to places of historic interest, museums, collections, botanical gardens, etc.

Annual Conference, usually in March/April.

Free use of the Royal Pharmaceutical Society of Great Britain's library facilities for research.

Help in historical research and with the identification of artefacts.

Affiliation to the International Society for the History of Pharmacy (ISHP).

Affiliation to the British Society for the History of Medicine (BSHM).

Application forms are available from the Honorary Secretary at the address above or on *www.bshp.org*

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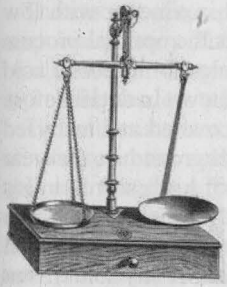

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Diary

Please note that for 2012, evening meetings will be held at the RPS, 1 Lambeth High Street, on Mondays, starting at 5.00 pm, unless otherwise noted..

Monday 13 February 2012
'The History of Doping in Sport' by Prof. Tony Moffat, Emeritus Professor of Pharmaceutical Analysis, London School of Pharmacy. **5.00 pm** at Lambeth.

Monday 14 May, 2012
'History of the Wellcome Foundation' by Dr Tilly Tansey. 5.00 pm at Lambeth.

Future dates
Monday 8 October 2012: to be confirmed.

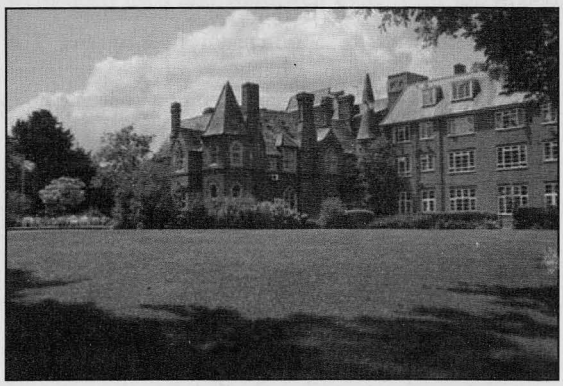
29 September 2011 to 26 February 2012
Exhibition 'From Surgeons to Plague Saints: Illness in Bruges in the 16th and 17th centuries'. At Memling in Sint-Jan Hospitaalmuseum, Mariastraat 38, B-8000 Bruges, Belgium.

Change of Address

Please note the change of official address for the British Society for the History of Pharmacy to that shown above for administrative purposes.
Telephone number 0116 274 7355; fax 0116 274 7365; email bshp@associationhq.org.uk

Facebook
With help from Briony Hudson the BSHP now has a Facebook page as part of its drive to communicate its activities more widely and also to a younger audience. You can find it by searching for "British Society for the History of Pharmacy"once you have logged into Facebook.

BSHP Annual Spring Conference
Friday 30 March to Sunday 1 April 2012



The annual conference 2012 will be held from at Abbots Barton Hotel, 36 New Dover Road, Canterbury CT1 3DU. Booking forms will be sent to members.

There is still time to submit a short paper or poster, preferably with a Canterbury or Kent aspect, but please let Shirley Ellis have a title as soon as possible. Send to:
Dr S Ellis, 1 Willow Way, Bottisham, Cambridge. CB25 9BS or e-mail shirleyellis@shirlellis.plus.com

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Vinegar – a traditional vulnerary as a modern topical antiseptic

Ursula Lang and Sabine Anagnostou
Marburg, Germany

In our paper 'Aromatic Vinegars – Antiseptics of the past' we raised the question whether vinegars, particularly aromatic vinegars, could be considered as reasonable antiseptic agents from past times, since the medicinal tradition of the application of preparations from vinegar as treatments against infectious diseases can be traced back to antiquity.[1] Consequently, it was of special interest to find out if, and to which degree of dilution, vinegar was effective against pathogenic germs.

Therefore, vinegar and aromatic vinegar preparations were tested for antimicrobial activity by a microbiological laboratory.

The tests were carried out with natural vinegar, synthetic acetic acid and three different acetic acid preparations enriched in each case by the essential oil of rosemary, thyme or clove according to the historical tradition. The authors considered that vinegar of past times contained lower amounts of acetic acid than vinegars of today. Ancient methods of producing wine of good quality with a sufficient amount of alcohol – a precondition for getting an adequate quantity of acetic acid – depended on various circumstances like the content of sugar, pure wine lees and the absence of oxygen. However, wine with low alcohol level resulted in vinegar with low acetic acid content, especially as the optimal process conditions for fermentation of alcohol to acetic acid through oxygenation were not known in detail before Louis Pasteur (1822–1895) discovered and analysed the microbial and chemical background in the year 1868 and published the results of his research in his work *Etudes sur le Vinaigre*.[2] Furthermore, it was considered that only a low amount of essential oil could be dissolved in vinegar without any solubiliser.

According to these assumptions, the tests for assignation of the minimal inhibition concentration (MIC) started with specimens of 3% acetic acid and 0.3% essential oil in those specimens with essential oils, which were then diluted step by step 1:1, 1:2, 1:4, 1:8 etc.

Results

Test of vinegar and acetic acid preparations for antimicrobial potency according to DIN 58940 part 7*

No. of sample	Sample
1	Wine vinegar 3%**
2	Acetic acid 3%
3	Acetic acid 3% + Rosemary oil 0,3%
4	Acetic acid 3% + Thyme oil 0,3%
5	Acetic acid 3% + Clove oil 0,3%

* BSL Bioservice, Scientific Laboratories GmbH, D-82152 Planegg: preparation of inocula:
The samples No. 1 to 5 were each diluted step by step 1:1, 1:2, 1:4, 1:8 etc. Each of the diluted samples was inoculated with the 5 different test organisms. The lowest concentration without certifiable microbial growth is the MIC (Minimum Inhibiting Concentration, corresponding to the content of acetic acid [%]).
An MIC of 0.38% is a dilution of 1:4, MIC of 0.19% is a dilution of 1:8, MIC of 0.10% is a dilution of 1:16.
** Sample prepared from sterile water and natural white wine vinegar (6% acetic acid), Weinessiggut Doktorenhof, D-67482 Venningen

Test organisms	No. of sample	MIC [%]
Escherichia coli ATCC 8739	1	0,10
	2	0,10
	3	0,10
	4	0,10
	5	0,10
Enterococcus faecalis (Streptococcus faecalis) ATCC 29212	1	0,19
	2	0,38
	3	0,38
	4	0,19
	5	0,38
Staphylococcus epidermidis DSM 1798	1	0,10
	2	0,19
	3	0,19
	4	0,19
	5	0,19
Proteus vulgaris DSM 13387	1	0,10
	2	0,10
	3	0,10
	4	0,10
	5	0,10
Pseudomonas aeruginosa ATCC 9027	1	0,10
	2	0,10
	3	0,10
	4	0,10
	5	0,10

The test results proved that specimens diluted lower than 0.5 % acetic acid content were effective against such pathogenic bacteria as *Escherichia coli*, *Enterococcus faecalis*, *Staphylococcus epidermidis*, *Proteus vulgaris* and also against *Pseudomonas aeruginosa*.

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The amount of essential oil did *not* potentiate the antimicrobial potency. The amount of essential oils that can be dissolved in vinegar with a content of 3% acetic acid is probably too low to have a measurable influence.

The test result gives evidence that the active substance of vinegar in the analysed samples is definitely acetic acid and that the antimicrobial effect could be shown even for notably low concentrations of acetic acid. Also highly diluted specimens containing under 0.5% acetic acid proved to be effective *in vitro* against different pathogenic germs.

As natural vinegar contains about five to six percent acetic acid vinegars of the present can be assumed to be antiseptic up to a dilution of 1:10.

The results of the test indeed lead to the conclusion that aromatic vinegars can be judged as effective antiseptics of the past, mainly for the content of acetic acid. As antisepsis and disinfection has always been essential in the treatment of wounds and various skin diseases, we investigated the traditional use of preparations from vinegar to treat infectious skin diseases and wounds.

From antiquity to early modern time

The 1st-century AD Greek physician Pedanius Dioscorides of Anazarbos described the use of vinegar for treatment of 'venomed' wounds after bites of poisonous animals and mad dogs in his famous work *De materia medica*. Bites of poisonous animals like snakes, scorpions, wasps, bees or spiders have always been feared, especially in past times when neither immune serums existed nor potent pharmaceuticals were available to combat an anaphylactic shock. Even if there was no systemic reaction, serious dermatologic problems, especially infections, could result as a consequence of the lesion. Inflammation, swelling and pruritus as concomitants of animal bites afflicted the injured and were often interpreted as intoxication. Also dog bites could provoke serious dermatologic reactions and thus were thought to be toxic as well: sometimes even weeks after a mad dog's bite the injured person could become seriously ill and finally die from an infection of rabies. Therefore, it obviously made sense, to try to avoid any kind of inflammation by using preparations from vinegar.

As vinegar was regarded to have contracting (astringent) properties, soaked sponges or wool were impressed on splashed and bleeding wounds, which evidently was accompanied by the antiseptic effect of vinegar. Above that, Dioscorides recommended the application of vinegar for skin infections like spreading ulcers, erysipelas, leprosy and lichen-like eruptions on the skin. Instilled into the ear, it was believed to cure stinging earache. Especially interesting is his advice to treat inflammations, erysipelas and burns with vinegar together with 'Cimolian earth', a white or purplish clay mineral similar to Fuller's Earth, to keep the afflicted areas free of blisters. Earths were thought to cool to the utmost and stop the pores.[3] So the combination of cooling vinegar and cooling earth could have been an excellent combination against burns or inflamed skin accompanied by heat and exudates by binding toxins. Above that we must consider that not only vinegar has antimicrobial potencies but also some clay minerals.[4]. Earths could also have served as an acid cataplasm (poultice) and reservoir for the vinegar. This relates to present methods of wound treatment as we will see.

In his famous encyclopedia *Naturalis Historia,* Gaius Plinius Secundus (23–79 AD), Pliny the Elder, recommended vinegar as therapy after bites of toxic animals as well as a topical application for different dermatologic diseases like lichen. Furthermore, Pliny suggested the use of cataplasms prepared with vinegar and barley flour, or the application of a paste made from cooked lentils and vinegar for treating abscesses and furuncles.[5]

Infectious skin diseases like pus-filled wounds after weapon injuries from arrows or lances were believed to be caused by poison when sensible heat and redness, pain and fever attacked the victims. So while physicians tried to remove the 'poison' from the intoxicated body with diaphoretic potions, purgatives, venesections and blood suction, surgeons treated the wounds topically with skin irritating wound preparations, cataplasms and compresses.

Scribonius Largus, the 1st-century Roman physician, described over two hundred recipes and traditional remedies in his collection *Compositiones*. Several compositions for the treatment of wounds were applied after washing the injuries with cold water, salt water, wine or vinegar. The application of anti-inflammatory plasters prepared with herbs, spices, resins, honey, mineral salts like alum, metals like copper, and vinegar were recommended to treat the gladiators' often horrible wounds.[6] In such preparations vinegar could have been used as a solvent and antiseptic agent.

In Arabian medicine preparations made from vinegar were often used and were well established for wound treatment. The celebrated Persian physician and philosopher Avicenna (980–1037) influenced European medical therapy for centuries. In his famous medical work *Canon medicinae*, that was used as a standard text in medieval medical schools, Avicenna enumerated a variety of indications for the external application of vinegar that reached from skin infections like erysipelas, different kinds of ulcers, scabies, impetigo and paronychia (whitlow) to fresh wounds and injuries caused by bites of poisonous animals and rabid dogs. He emphasised that vinegar prevented the inflammation of wounds and the migration of ulcers.[7]

In medieval Europe, vinegar was generally used against infectious dermatologic diseases. Vinegar and plasters of lentil vetch, vinegar and honey for example were applied on 'scrofula', a complex illness of the inner and outer neck accompanied by inflammation and infection. Leprous victims were rubbed with a cataplasm of clay, olibanum and vinegar. The acid clay had to dry in the sun and was then washed away with salt water to have an extra desiccative effect.[8] As we still today use acid aluminium acetate compresses as a remedy for inflamed skin, the treatment of leprosy with clay and

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vinegar can be estimated as a useful aid in drying and disinfecting ulcers.

Surgical writings by the medieval Italian surgeon Lanfrancus Mediolanus (ca.1245–1306) passed down to early modern times through copies and also through translations from the original Latin texts over many decades. He recommended the use of rose oil, vinegar and Bolus Armenicus against wounds caused by swords and arrows and warned to use warm water because this would bring pus to the wounds.[9]

In early modern times gunshot wounds were a new challenge for surgeons. They were considered to be eminently poisonous because they usually became purulent and had an offensive smell. The treatment of battle wounds was described in the 16th century in works on military surgery illustrated by wood cuts. Hans von Gersdorff (c. 1455–1529) was an exceptional surgeon who described a variety of different therapies in his famous *Feldtbuoch der Wundartzney*. For instance, Hans von Gersdorff recommended the use of preparations of oxymel made from vinegar, honey and rose oil, for wounds of the skull and 'unguentum egyptiacum' an ointment made from copper, alum, honey and vinegar for gunshot wounds.[10]

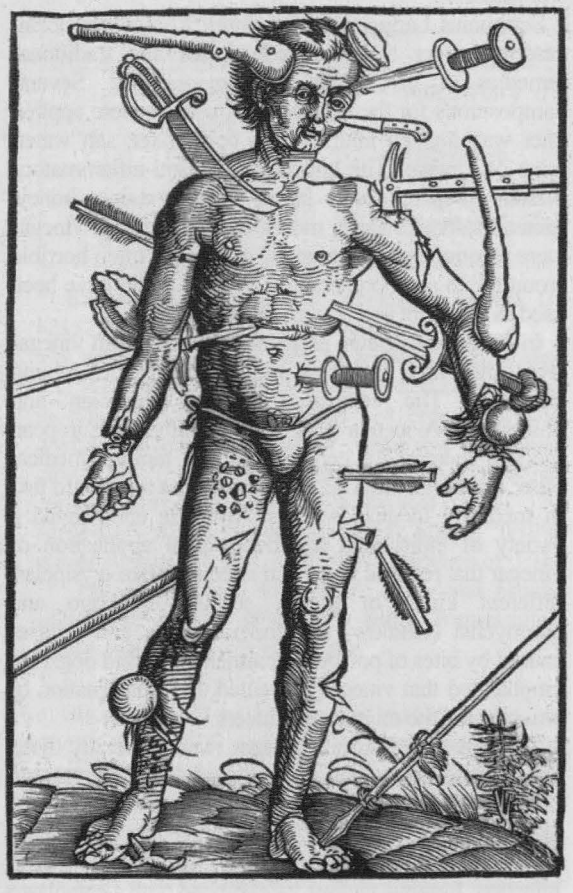

Figure 1. Wound man, illustration of different wounds of the human body. Hans von Gersdorff. *Feldtbuch der Wundartzney*, Straßburg, 1517.
Picture Archive, Institut für Geschichte der Pharmazie, Marburg

The surgeon Hieronymus Brunschwig (c. 1450–1513), author of the *Chirurgia*, recommended an ointment for wounds prepared with rose oil, camphor, vinegar, some herbs and healing earths.[11]

Wound treatment in this way was certainly more bearable and perhaps even more effective than the other very aggressive therapies often practised, like cauterisation with boiling oil. After such painful and injurious treatment, the soldiers suffered from fever, great pain and often died.

The 18th and 19th century

In the 18th century, Johann C. A. Theden (1714–1797), a German surgeon in the Prussian army and later leading surgeon at the Charité hospital in Berlin, invented the 'Mixtura vulneraria-acida' or 'Aqua vulneraria Thedenii', the 'Theden vulnerary', a mixture of vinegar, alcohol, diluted sulphuric acid, honey and water for cold covers of wounds.

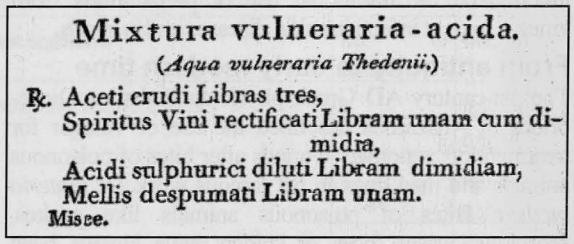
Mixtura vulneraria-acida.
(*Aqua vulneraria Thedenii.*)
℞. Aceti crudi Libras tres,
Spiritus Vini rectificati Libram unam cum dimidia,
Acidi sulphurici diluti Libram dimidiam,
Mellis despumati Libram unam.
Misce.

Figure 2. Mixtura vulneraria-acida (Aqua vulneraria Thedenii), *Pharmacopoea Borussica 1799*, p.120;
Universitätsbibliothek Marburg.

Cold but not icy compresses saturated with water and the addition of vinegar were still used in 1836 in the famous Charité hospital in Berlin and regarded as an effective method to prevent the feared nosocomial infections of great wounds.[12]

Vinegar as a topical antiseptic in modern times?

An *in-vitro* investigation of the potential of burn wound therapy with a Suprathel®-Acetic-Acid-Matrix as an antiseptic dressing was reported by the department of Hand-, Plastic- and Reconstructive-Surgery-Burn-Center at the University of Heidelberg. Suprathel® is a synthetic wound dressing that imitates the properties of natural epithelium. Suprathel® in combination with natural vinegar (3% acetic acid) was demonstrated to have excellent bactericidal effects against the typical bacterial spectrum of burns like *Pseudomonas aeruginosa* and methicillin-resistant *Staphylococcus aureus* (MRSA).[13]

Only a few clinical trials using acetic acid as a topical antiseptic have been reported. Solutions with a content of 0.25 to 0.5% acetic acid were tested in the treatment of

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superficial wounds, especially when infected by *Pseudomonas aeruginosa,* and showed an effective decrease of pathogenic micro-organisms.[14]

It is important for clinicians to weigh up the benefits of using antiseptic agents to prevent infection and contamination against suppression of tissue repair and perhaps cytotoxic effects associated with the use of these agents. But in cases where physicians are faced with multi-resistant bacteria, it may be that they will go back to their roots and try vinegar, as sterile acetic acid solutions, together with modern wound dressings.

It is obvious that the traditional application of preparations from vinegar as vulneraries made sense. Empirically, physicians and surgeons of past times learned that such remedies could prevent inflammation and support the healing of wounds, even though they had no ideas of modern antisepsis. It seems correct that Dioscorides recommended vinegar as a treatment for wounds and it could have been helpful to instill vinegar into aching, possibly inflamed or infected ears. Acetic acid solutions and aluminium acetate solutions are even nowadays often recommended for divers with ear infections; and also his advice to use vinegar with a 'matrix of Cimolian earth' against burn wounds sounds anticipatory considering some recent research in the treatment of burns. The results of this study can teach us once more that traditional therapies based on empirical experience could have been reasonable and may even give us impulses for modern therapies.

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A chemical study of some 17th century Italian soaps

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A Short History of Soap

The industrialised mass production of cheap solid bars of soap,[1] used almost exclusively for cleansing[2] the human body, is a relatively recent innovation in the long history of soap/ 'soap'.[3] The earliest known written records referring to 'soap' recipes were found on Sumerian clay tablets dating to the third millennium BC. Also, in the later Babylonian and Akkadian periods (second and first millennium BC respectively) similar recipes were found.[4,5] However, in all these ancient Near Eastern recipes the 'alkali' mentioned (along with water and various oils) is *not* the caustic alkali (sometimes, 'lye') needed to make soap, but mildly alkaline (and impure) tree or plant *ash*.[6] The alkaline soda ash, from particular plants' ashes, was used in water for body and textile (such as wool) washing. It is thought unlikely that aqueous extracts of the plants themselves were made in this time period. The ashes and oils/fats *together* appear to have been used only for a variety of *medical* purposes.[4,5]

In ancient Egypt there was a habit of ritual body washing at least, both in (priestly) life and during mummification after death, using an aqueous solution of natron. Natron was, and still is, a readily available local material usually consisting mostly of sodium carbonate and bicarbonate. When a small amount was dissolved in water it would have given a mildly alkaline solution and so could be used as a multi-purpose washing 'soap'.[4,7] Also, various (absorbent) clay minerals (e.g. Fuller's earth), plants' ashes (e.g. soapwort, *Saponaria officinalis*) and a variety of paste mixtures were used.[4,8] Some authors maintain that apart from natron in water no other forms of 'soap', for personal cosmetic use rather than for washing clothes, were known in ancient Egypt.[9] However, others say that non-natron 'soaps' probably were so used *and* that hair/wig soap shampoo was known in the 18th dynasty (1550-1295 BC)[10] of the New Kingdom (1550-1069 BC)[10] period.[11]

It is often stated that soap, both hard and soft, was first made/invented by the Phoenicians (of modern-day northern Lebanon) in c. 600 BC.[12] They could then have transported and traded this relatively expensive item (and how to make it) via their extensive trade routes to their outposts in north Africa, southern Spain and also to the edges of the Greek Empire (eg modern Sicily).[13] However, neither the Greek or (early to middle at least) Roman Empires are known to have used soap.[4,12] People from both Empires did bathe on a regular basis in the many public baths; with the rich often having their own private baths. Bathing involved being half-immersed in a series of pools of varying temperatures, which did *not* have regularly circulating water and so must have been quickly polluted on a busy day, followed by an oil massage. This oil, plus any underlying dirt and sweat, was then scraped off.[7,14,15] The washing of clothes was often done with water alone and much manhandling of the clothes; though in later Roman times there were also used: the soapwort or similar plant to give a weak lather, various clays for degreasing and urine as a bleach.[4,12,16]

The Roman writer Pliny the Elder (d. 79 AD) names the 'barbarian' Gauls and Germans as being the first people in (Western) Europe to 'invent' soap. This possibly occurred, via 'knowledge migration', from the Phoenician outposts of southern Spain into Gaul and Germany. The best was said to be made from birch wood ash and goat tallow (rendered fat). However, it is unclear from the text if he was referring to soap made from lye, or to 'soap' made only from the ash. Also, it was only used as a (reddish) hair dye (presumably with added vegetable dye) and possibly as a bleaching agent (i.e. with excess alkali to give blond/bleached hair).[8,14] Later, in the Roman Empire of the second century AD, the noted physician Galen (c. 130-200 AD) mentions what is generally taken to be soap (rather than 'soap') as a medicine *and* for general personal hygiene via body washing.[4,9,17] Thus it is assumed that by this time period soap was known to the Romans, and used by them as a multi-purpose washing material.

In the early European Middle Ages (where the Middle Ages is taken to be between c. 500 and c. 1500 AD) it has often generally been assumed that production and usage of soap was very small.[8,16,18] However, organised small-scale manufacture of soap *did* occur in the soap-maker craft guilds; and one of the first such guilds mentioned in the literature is one in Naples in the late 6th century AD.[19] More soap-making guilds were soon formed and they in turn started their own manufacturing sites, over the next centuries, in: France (eg Marseilles), Italy (eg Genoa, Savona and Venice) and Spain (eg Castile).[12,18] By the end of the 12th century AD soap-making was an established craft in England (eg Bristol),[20] and by the end of the Middle Ages European soap production, albeit on a relatively small scale at each site, was well established.[8]

Over the next century soap production in England, and domestic usage per person, increased. By 1643 soap had been designated one of the eight staple domestic 'necessities' (the others being: beer, spirits, cloth, salt, glass, leather and candles) that were to be taxed under a new Commonwealth Excise system.[7] Plain unscented soap was one of the very few 'cosmetics' tolerated by the English Puritans, and even actively encouraged.[7,8] Tax on soap remained in place in England until 1853, when it was finally totally abolished.[21] The resulting drop in price increased its availability to all classes of society, removed the smuggling incentive, and from the resulting increase in personal hygiene – which greatly reduced the risks of cross-infection of many infectious diseases – many lives were undoubtedly saved. Rising soap consumption has been found to be consistently associated with declining infant mortality rates across diverse geographies and time frames.[22]

It is thought that prior to the beginning of the 17th century, in northern Europe and England at least, that most of the soap made and used domestically was soft soap.[20,23] Soft soap was easy and quick to make using the readily available resources

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of (imported) olive oil or locally obtained fats, plus the ash of local hardwood trees. The tree ash gave the potash (potassium carbonate, K_2CO_3) needed for the soap's manufacture.[6] However, trees dwindled and were increasingly reserved for houses and ships. Also, tree ash was used in the refining/purification of salpetre (potassium nitrate, KNO_3) (an essential component of gunpowder) until at least the late 18th century.[17] Additionally, soft soap was not easy to handle and individually package (often being sold by the barrel). It could *not* be made in a pure form by 'salting out' as could hard soap,[24] and so any impurities in the original ingredients were also present in the final product. It often contained a large percentage of water (often from 25 to 30, and sometimes as high as 50% by weight [20]) and was sometimes too caustic for use on sensitive human skin and delicate fabrics.

Hard soap, on the other hand, had a much lower water content (*now*, no more than 12%; but in the past as high as 30% by weight [20]) and could be made in a purer and usually in a less alkaline form than soft soap. It was also easier to handle and package, eventually being sold in individually wrapped solid 'bars' – rather than the previous method of being carved off from a large block by the shop-keeper, which was not always totally hygienic. However, it did take longer to be available as it had to be cured and dried for some weeks after manufacture. The resources needed were a ready supply of fat/oil and plant/kelp ash; the kelp was readily found along the shore-lines of most Mediterranean countries, and various plants were available inland. The ash was then used to make the soda (sodium carbonate, Na_2CO_3).[6] However, as the Industrial Revolution gathered pace in Europe of the early-to-mid 18th century the soda was increasingly being used in the expanding industries of glass and paper making, and in the bleaching/dyeing of textiles.[25] So great was the demand from these new industries, that in some countries by the mid-18th century the shortage of soda was becoming acute. In France especially the situation was sufficiently desperate for the Government to offer a cash prize in 1781 to anyone who could make soda reliably on an industrial scale from salt (i.e. sodium chloride, NaCl).[25]

In 1789 a successful process to make soda was demonstrated in France by Nicholas Leblanc (1742-1806), which became known as the 'Leblanc alkali process' and was used until the 1880s, when it was replaced by the cleaner and more efficient Solvay process.[25] The use of these mass production techniques for soda and the continued ready availability of various fats/oils, plus the removal of the soap tax in England in 1853,[21] meant that by the late 19th century the manufacture of (mainly now hard) soap in England had soared and its consumption/capita/year had substantially increased.[20,22,26,27]

Soap consumption numbers for England from before the beginning of the 17th century have been impossible for us to find or even reliably estimate. The numbers from the early 1600s to before the first census in England (1801) can only be estimates, as they are based on any known *legal* soap production values and an estimate of the population. Even when the latter is known from the latest census, the former could still be an underestimate. Also, numbers quoted (in lbs./capita/year) for up to the start of the 20th century are for *all* aspects of domestic usage; that is covering the washing of the body, clothes and a variety of other household surfaces.[22,26,27] Later numbers (usually now given in kg/capita/year), for the 20th century, are only for domestic *toilet* soap consumption (i.e assumed to be just for washing the body).[28] Overall, from the 1630s to 1891, the total domestic soap consumption/capita/year in England increased about four-fold. An approximate doubling occurred over the first c. 220 years (ie to 1851) and another such increase over the next c. 40 years (ie to 1891).[29] After c. 1910 special man-made detergents – which strictly speaking are not soaps,[1] but are of a similar general chemical composition[28,30] – were increasingly available for washing clothes and surfaces. Thus (hard 'bar') soap became increasingly to be used only as a *toilet* soap.

Medicinal uses of 'soaps'/soaps have been many and varied over time, some examples are: using various 'soaps' for treating stomach disorders, as a mouthwash, as an enema and for fumigation in the ancient Near East;[4,5] using 'soaps' for treating/covering skin diseases, burns and sores in ancient Egypt;[4,31] similar usage in Roman times, using both soap and 'soap';[12,17] soaps were taken internally as a mild antacid or laxative in the Victorian period;[32] and soap was used as a filler in pills and also often in lieu of any real 'active ingredient' in a whole range of 'quack' medicines, from at least middle Victorian times until the early 20th century.[33] Today, dilute (up to 2% aqueous solutions) potassium oleate (the main ingredient of soft soap made using olive oil – see later) has been found to be very effective as a pesticide against cockroaches (which can be carriers of various infectious diseases).[34]

Samples and Provenance

Ferdinando II de' Medici (Figure 1), Grand Duke of Tuscany (1610-1670, ruled 1621-1670), greatly admired the courage and character of Oliver Cromwell (1599-

Figure 1. Ferdinando II de' Medici, Grand Duke of Tuscany. (Wikimedia Commons)

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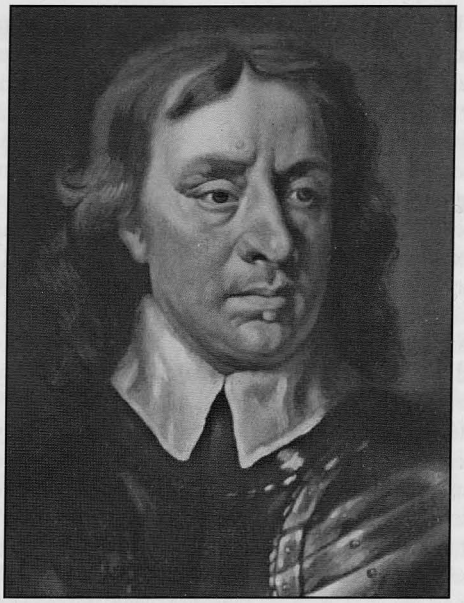

Figure 2. Oliver Cromwell, Lord Protector of England. (© Cromwell Museum, Huntingdon, UK)

1658; Figure 2), Lord Protector of England (1653-1658). In May of 1654 the Grand Duke instructed his English agent to acquire a portrait of the newly elected Lord Protector, and by the end of the year a portrait had been delivered to him. Exactly which portrait he acquired is unclear; it could have been the famous ('warts and all'; see Figure 2) painting done by Sir Peter Lely (1617-1680) or possibly the one reputedly done by Robert Walker (1599-1658).[35] However, this latter picture is sometimes attributed to Lely and such a picture is now in the Uffizi Gallery of Florence. The more famous Lely picture is now to be seen in the Pitti Gallery of Florence.

Figure 3. The Florentine cabinet and its samples' containers. (© Cromwell Museum, Huntingdon, UK)

There is evidence that in 1657 the Grand Duke sent various gifts to Oliver Cromwell, one of which is reputed to be the stone inlaid Florentine cabinet and its contents (Figure 3) currently on display in the Oliver Cromwell museum in Huntingdon (Cambridgeshire, UK). The cabinet's dimensions are: 41cm wide by 36cm deep and 29.5 cm high. The cabinet has also been independently inspected by furniture historians, and assessed to be a Florentine 'pietra dura' ('hard stone') cabinet made in the period 1653-1658.[36] The contents of the cabinet's small tubs/pots (seen in the foreground of Figure 3) are believed to have been made up by the 'L'officina Farmaceutica di Santa Maria Novella' in Florence prior to the cabinet being sent to England.[37]

The contents of the cabinet's tubs/dishes were all removed and placed in modern air-tight screw-top containers about thirty years ago. Samples from the top drawer of the cabinet were all thought to be soft soaps, as they were all soft solids (of modern-day shampoo/ toothpaste consistency) and one of the samples (labelled by the museum as TD 4) still had readable words on its original parchment cover – 'Saponetto di Fior' Aranci' (literally 'Small soap with orange tree flowers'; and where the use of Fior', rather than Fiori, shows that the label was written before 1700, when usage of the apostrophe ceased). Also, when a small amount of TD 4 was mixed with some de-ionised water an observable lather was obtained.

We were recently very fortunate to have made available to us, for chemical characterisation, small amounts from four of these screw-top containers (labeled by the museum: TD 2/4/5/12), whose contents had originally come from the cabinet's top drawer. Thus we present here the results of our chemical studies on these four 17th century samples.

Analytical Methods and Results

The four samples (TD 2/4/5/12) were chemically characterised predominantly using two analytical techniques. Quantitative elemental composition was given by the technique of Low Vacuum Scanning Electron Microscopy (LVSEM), and semi-quantitative identification of the crystalline compounds present by the X-Ray Powder Diffraction (XRPD) technique. Also, some initial (qualitative) work was done on one sample (TD 4) using a third technique, FT-IR (Fourier Transform Infrared) spectroscopy.[38,39]

The four samples were all soft dull brown solids with no discernible odours. Their pHs were estimated using Universal pH paper, and their values found to be: TD 2 (pH 9); TD 4 (pH 10); TD 5 (pH 10) and TD 12 (pH 9.5). Also, a small amount (accurately weighed) of one sample, TD 2, was placed in a desiccator in order to remove 'loose'/unbound water from the sample. After a few days a constant (lower) weight was obtained. The

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percentage unbound water in the sample was then calculated and found to be 7.3%.

The LVSEM results were (in decreasing order of elemental weight percent, with the elements in '(.....)' having values of 1% or less each and those in '[.....]' being those elements only occasionally found and always in very small amounts):

TD 2: C, O, K, Na, S (Cl, Si).

TD 4: C, O, K, Na, S (Cl, Si, Al) [Cu].

TD 5: C, K, O, Cl, S, Na.

TD 12: C, O, K, Na, S, Cl (Si, Al) [Pb, Mg, P, Ca].

The XRPD results on the four samples were problematic to interpret. It quickly became apparent to us that (for all the samples) whilst many of the minor peaks in the collected data could be associated with specific compounds (see later Discussion section), the major peaks did not match any compounds in the JCPDS database.[40] However, from the general pattern of the low-angle (i.e from about 2 to 10 degrees) two-theta x-ray diffraction peaks, being near-identical in all the samples, the presence of two crystalline lamellar-lattice compounds per sample was indicated. Additionally, from the pattern of their relative intensities, the presence of crystalline soap was predicted. Also, from fragmentary diffraction data (i.e. some of the larger d spacings) in the published literature, a probable 'match' for one of these compounds is potassium oleate (K^+ $C_{17}H_{33}COO^-$).[41,42] Potassium oleate is the main component found in soaps made from caustic potash (KOH) and olive oil (the glycerol ester of oleic acid being its main component). The second compound could then be the 1:1 oleic acid:potassium oleate complex, where its presence is also indicated from limited diffraction data found in the literature.[42,43] Its presence/amount depends on the temperature, percentage water present and the pH of the sample. More details are given in the later Discussion section.

The FT-IR work done on one sample (TD 4) strongly indicated that the sample was a hydrated soap. It is hoped that more detailed work on all the samples using this technique will be done later and the results be part of a possible later second paper.

Discussion

The chemistry and crystallography of the sodium/potassium soaps can be complex. The oil or fat used to make a soap contains several esters and so a mixture of various chain length acid salts will be present in the final soap.[44] These salts can exist both with and without varying amounts of bound water (i.e. water of hydration). Also, various acid:salt complexes can form. The percentage presences, and even the existence of these salts and complexes, depend on temperature, pH and amount of water present in the sample and on the particular oil or fat used to make the sample.[41,42,43] Also, impurities in the caustic alkali (lye) used in the past can give rise to further impurities in the final soap, especially for potassium soaps or for sodium soaps that have *not* been made by the 'salting out' process. Olive oil usually contains over 80% of the oleic acid-glycerol ester [44] and so the major soap salts formed will be the sodium/potassium oleates when it is reacted with lye. Also possibly expected, depending on the above mentioned factors, would be oleic acid:salt complexes.[42]

As *our* LVSEM results show a large percentage of potassium over sodium (the ratios of potassium:sodium vary between 5.6:1 and 15.8:1), and if we assume that the FT-IR spectra for samples TD 2/5/12 are the same as that found for sample TD 4, then we can say that our four samples are very likely hydrated potassium (soft) soaps.

If olive oil was used to make our four samples, then potassium oleate and possibly some 1:1 oleic acid:potassium oleate complex would be expected to be their main components (where any chemical degradation over time is assumed to be small). Using the limited diffraction data for these two compounds found in the literature,[41,42] we can say that their presence is definitely indicated in all our samples. Also, assuming the total (i.e. bound and unbound) water content in the samples to be small and approximately the same for each sample and that their ambient temperature has been in the range 20 to 25 C, then the ratio of acid-salt complex to the salt should depend inversely on the pHs of the samples.[43] This is in fact found to be the case; where the ratio and pH value for each sample are (in increasing pH order): TD2 1.7:1 (pH 9); TD12 1.5:1 (pH 9.5); TD5 0.7:1 (pH 10) and TD4 0.6:1 (pH 10). The impurities found, in small amounts in each sample, of mainly potassium sulphate and chloride are to be expected – coming from the tree ash used to make the lye.[6] The very small amounts of copper (in TD 4) and lead/magnesium/calcium (in TD 12) are assumed to originate either in the tree ash used or from the vats used (often made of copper) to make the soaps.

So, overall, our LVSEM results – when combined with the known provenance data, some limited FT-IR data and the general 'pattern' of the low-angle diffraction data – show that all our samples are hydrated potassium (soft) soaps. Also, from the phase diagrams and diffraction data in the literature on potassium oleate and its 1:1 acid-salt complex,[41,42,43] we can say that our XRPD results are consistent with both compounds being present in all four of our samples. This in turn indicates that the oil used to make our soap samples was probably olive oil.

Very few chemical composition studies of *old soaps* have been published. We have found only two such studies in the published literature. One was where a twenty-year old (hard bar) sample of Pears 'Transparent Soap', along with a recently manufactured such sample, were chemically analysed and found to be identical in chemical composition.[45] The other sample was very much older, as the site (Deir el-Bahri) where it was found has been dated to the 18th dynasty (1550-1295 BC[10]) of ancient Egypt.[11,46] The details given of the sample's chemical composition are limited, but the sample is said to be the remains of 'a waxy solid soda soap' ('La substance n° 2, cireuse, est un savon solide de soude.').[46] As the site has been designated as a wig workshop then it seems very likely that this soap had been used as a hair/wig shampoo.

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We may publish, at a later date, another paper on these samples, where we will present the results of further analytical work done, using such techniques as: FT-IR Spectroscopy, FT-Raman Spectroscopy, GC-MS (Gas Chromatography-Mass Spectrometry) and FAME (Fatty Acids Methyl Esters) GC-MS. Additionally, we have asked an Independent Experimental Archaeologist (Ms S. Pointer) to make for us some chronologically relevant 'reference' soft soap samples,[47] and their LVSEM and XRPD data will also be included in this later paper. Also, we hope to publish in the near future chemical composition studies of samples from other drawers in this Florentine cabinet.

Conclusions

Time is not usually kind to carbon-based organic artefacts: metal-based inorganic ones fare better. Also, old soaps, which are strictly speaking organo-metallic artefacts, are found but rarely. Soaps, once used, leave no trace in the historical/archaeological record. Only if stored away, perhaps largely unused, will they be available for later study. Our samples are one such rarity, as they were made in Florence about 350 years ago. Based on the results of the analytical techniques used in this study we can say that all four samples are hydrated potassium (soft) soaps. We feel that the oil used in their manufacture was probably olive oil, but further work is needed to make this a certainty.

To our current knowledge they are the first such samples to be chemically characterised from this time period (i.e. the 17th century). No evidence was found, in any of the four samples studied, that a medicinal agent had been added. So they are assumed to have been made solely for personal hygiene usage. Also, whilst there is some evidence that these samples were given to Oliver Cromwell, there is no evidence that he *used* them.

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Endnotes and References

1. Soaps are the metal salts of long hydrocarbon (7 to 22 carbon atoms) chain carboxylic acids ('fatty acids'). These acids can be 'saturated'(*no* carbon to carbon double bonds) or 'unsaturated' (one or more such double bonds). Soaps are made from the chemical reaction between a fat or oil and an alkali (ie an aqueous solution of a metal hydroxide), the reaction mixture often being heated. Fats and oils are mixtures of esters, an ester being a compound formed from the combination of a fatty acid and an alcohol, and they must first be broken down into their fatty acids by water (ie hydrolysis) before reacting with the alkali. The overall process is sometimes referred to as saponification (ie alkaline hydrolysis). Soap, when made using a sodium or potassium-based alkali, is water soluble and gives a cleansing lather when applied to a wet surface. Soap made from the sodium-based alkali (caustic soda, NaOH) is hard, whilst that made from the potassium-based alkali (caustic potash, KOH) is soft, with the consistency of modern-day shampoo or toothpaste. Both soaps are alkaline, with pHs usually of between 7.5 and 9.5.
In this section of our article we are concerned primarily with the history of water-soluble soaps and their cleansing properties; that is their manufacture and usage from the Near East to England via the Mediterranean shore-line countries. Briefly mentioned will be some of the past and present medicinal uses of all types of soaps.

2. The cleansing of a water-wet surface by water-soluble soap occurs because the soap molecule has two parts; a hydrophilic 'head' (consisting of the positively charged sodium/potassium atom and a negatively charged oxygen atom of the carboxylic acid) and a hydrophobic 'tail' (consisting of the long hydrocarbon chain of the acid). The latter preferentially associates with any grease present (usually also holding dirt to the surface), whilst the former is strongly attracted to the water molecules. The water's attraction to the soap molecule's 'head' is strong enough to lift away the 'tail' *and* any associated grease/dirt on the surface. However, if the water used is 'hard' (i.e. contains dissolved calcium and magnesium compounds) then an insoluble scum, of a calcium/magnesium soap, is formed before any useful lather.

3. In this article the word soap is used to mean 'true soap', that is, soap deliberately made, and separated out from a reaction mixture, as described in Endnote 1. However, when we use 'soap' we are referring to a cleansing (and/or sometimes medicinal) agent of some sort, but *not* to 'true soap'. Thus 'soap' can be: one of the components used to make soap (eg an alkaline material or an oil); several of the components, used in succession (e.g. body washing with water, then an alkaline material and finally an oil); a mixture of fat/oil and *ashes* (where the latter are mildly alkaline, do *not* contain any metal hydroxides and also contain significant impurities); a plant (e.g. soapwort, S*aponaria officinalis*) or an unrelated substance (e.g. sand or pumice stone). All of these 'soaps' would give a degree of cleansing power, but less than that from soap.

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6. In modern soap-making the (pure) caustic soda/potash used is bought commercially; but in the past it was made,

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albeit impure, from ashes. Hardwood tree ash is rich in the mildly alkaline potash (potassium carbonate, K_2CO_3) and plant/vegetable/kelp/seaweed ash is usually rich in the similarly alkaline soda (sodium carbonate, Na_2CO_3). However, both compounds are always present in any type of ash. To make the caustic soda/potash ('lye'), hot water is poured through the ash whilst held in a cloth. The cloth acts as a filter, allowing almost exclusively only the water-soluble sodium and potassium salts present in the ash to pass through. The hot water also converts most of the sodium/potassium carbonates present into their hydroxides, both being water-soluble. The resulting solution is later partially evaporated to give a solution of higher pH. The final solution does contain impurities, mostly consisting of the sodium/potassium sulphates and chlorides.

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It should also perhaps be mentioned here that the once ubiquitous hard bar of soap has recently been removed from the basket of goods used to calculate the (UK) Consumer Price Index and Retail Price Index (See: Editorial, *The Guardian*, Tuesday 16 March 2010). The bar of soap is being increasingly replaced by the liquid soap dispenser; as if, after several centuries, we are going 'full circle' back to (very) soft soap usage.

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of which there can still be read Italian words) and this with filigree fabric.

37. Unfortunately, though the Pharmacy agrees that it did make gifts for this Grand Duke, they have been unable to find evidence that they made *these* samples. The website address for this famous pharmacy in Florence is: www.italian.it/santamarianovella/smnuk.htm .

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Yorkshire Relish

Peter G Homan, FRPharmS
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In 1837 Robert Goodall, a Chemist and Druggist, founded a wholesale company known as Bell and Brooke in Boar Street, Leeds. They produced a range of products, including baking powder, mushroom ketchup, ginger beer powder and what the company described as its "celebrated Yorkshire Relish". In 1858 Robert Goodall went into partnership with another chemist and druggist, Henry Backhouse and the name was changed to Goodall Backhouse & Co. Robert Goodall died in 1870 and his place was taken by William Powell.

In 1873 a reporter from the *Chemist and Druggist* visited the company and wrote:

> Well known in Yorkshire and the adjacent counties, this house had for many years carried on a steady prosperous wholesale trade, but of somewhat local character. Suddenly they seemed to resolve on a more universal style of business, and the result of their enterprise has been most remarkable. The name and their productions are now famous from one end of the world to the other.

Figure 1. Picture of Relish from C&D Diary 1905.

The Company had recently built a new factory in White Horse Street in the centre of Leeds, near to their old premises. The *Chemist and Druggist*'s reporter goes on to say:

> We remember winding about a mighty cellar, amid a lot of oil cisterns as big as cottages; seeing bottle-washing by steam; paste-making by steam; an extensive laboratory; everything worked by steam power; and every now and again a hive of girls putting up in packets such articles as baking powder, Epsom salts, carbonate of soda, quinine wine, and most interesting of all, the celebrated Yorkshire Relish.

According to the reporter, the Relish had been introduced eight years earlier (that is 1865). It had become the flagship product: 'The best and cheapest sauce in the world. Sixpence a bottle – same size as most others sold at one shilling.'

The sauce was actually manufactured in another part of Leeds and transported in casks to the factory for packaging. It was hoisted to the top of the building where there were tanks which held about ten thousand gallons. From these tanks it passed to a gigantic cistern on the floor below which was equipped with a steam driven fan to keep it mixed. It was then run into what was described as a sort of aqueduct with several spouts on both sides. A girl would sit at a spout with a supply of bottles which she would fill with the 'piquant aromatic relish'. They apparently bottled at a rate of 80 gross (nearly 12,000) bottles per day and were hard pressed to keep up with their orders.

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This advert from C&D Diary, 1880 (Figure 2) shows a range of products that the company was producing. Baking Powder, Quinine Wine, Custard Powder, Ginger Beer Powder and Brunswick Black (for painting stoves, grates, iron and tin) - as well as the celebrated Yorkshire Relish.


SEVEN PRIZE MEDALS AWARDED.

GOODALL'S

HOUSEHOLD SPECIALITIES.

Goodall's Yorkshire Relish

THE MOST DELICIOUS SAUCE IN THE WORLD.
This cheap and excellent Sauce makes the plainest viands palatable, and the daintiest dishes more delicious. To Chops and Steaks, Fish, &c., it is incomparable. Sold by Grocers, Oilmen, Chemists, &c., in Bottles, 6d., 1s., and 2s. each.
Over FOUR MILLION (4,000,000) Bottles Sold Annually.
LARGEST SALE OF ANY SAUCE IN THE WORLD.
CAUTION.—On each Yorkshire Relish Label is our Trade Mark, Willow Pattern Plate, and name, GOODALL, BACKHOUSE & Co. No other is genuine.

Goodall's Baking Powder

THE BEST IN THE WORLD.
The cheapest, because the best, and indispensable to every household, and an inestimable boon to housewives. Makes delicious Puddings without eggs. Pastry without butter, and beautiful light Bread without yeast. Sold by Grocers, Oilmen, Chemists, &c., in 1d. Packets; 6d., 1s., 2s., and 5s. Tins.

Goodall's Quinine Wine

The best, cheapest, and most agreeable tonic yet introduced. The best remedy known for Indigestion, Loss of Appetite, General Debility, &c. Restores delicate individuals to health and vigour. Sold by Chemists, Grocers, &c., at 1s., 1s. 9d., 2s., and 2s. 9d. each bottle.

Goodall's Custard Powder

For making delicious Custards without Eggs, in less time and at half the price. Unequalled for the purposes intended; will give the utmost satisfaction, if the instructions given are implicitly followed. The Proprietors entertain the greatest confidence in the article, and can recommend it to Housekepers generally as a useful agent in the preparation of a good Custard.

Delicious to Plain Pudding.	Delicious to Stewed Rice.
Delicious to Jam Tarts.	Delicious to all kinds of Fruit.
Delicious to all kinds of Puddings.	Delicious to everything.
Delicious to all kinds of Fruit Pies.	Delicious at Dinner.

Sold in Boxes, 6d. and 1s. each, by Grocers, Chemists, Italian Warehousemen, &c.

Goodall's Ginger Beer Powder

Makes Three Gallons of the Best Ginger Beer in the World for 3d.
Is a delicious and invigorating beverage, possessing valuable medicinal properties. It is cooling in its nature, and a most wholesome beverage for both winter and summer. It is easily made, and is by far the cheapest and best Ginger Beer Powder ever offered to the public. Sold in Packets, 3d. and 6d. each, by all Grocers, Chemists, and Italian Warehousemen.

Goodall's Brunswick Black

FOR PAINTING STOVES, GRATES, IRON, TIN, &c.
This invaluable composition is superior to any yet offered to the public, possessing great brilliancy, and thoroughly protecting the article it is applied to. Sold in Bottles at 6d. and 1s. each.
SOLE MANUFACTURERS,
GOODALL, BACKHOUSE & CO., White Horse St., Leeds.
A Monthly Price List of Drugs, Chemicals, Druggists' Sundries, Patent Medicines, &c., can be had on application.

Figure 2.

This cheap and excellent Sauce makes the plainest viands palatable and the daintiest dishes more delicious. To Chops and Steaks, Fish etc it is incomparable. Sold by Grocers, Oilmen, Chemists, etc. in bottles 6d, 1/- and 2/- each.

Sales of the relish (according to the manufacturer) were over four million bottles a year, 'the largest sale of any sauce in the world.' In 1888 the *Chemist and Drugggist* revisited Goodall Backhouse and Co. Business had continued to grow at the same rate and the company had extensively enlarged the premises and opened another manufactory in Sovereign Street. They toured the White Horse Street building with William Powell, of whom it was said:

> He starts on his letters at seven o'clock every morning and gets the day's work into battle array before he goes home for breakfast.

As well as general offices there was a machine room for tin box manufacture, the custard and blanc-mange powder packing room, the quinine wine and general bottling room, the egg and baking powder packing room, the wet department laboratory and the tincture room which contained some mammoth vats for storing liquid galenicals and mushroom ketchup.

And of course there was the Yorkshire Relish bottling room. The cistern had been replaced with a vat which held 1100 gallons and had steam-driven fans to keep the relish mixed. The vat was filled from barrels on the floor above. The relish passed into a trough which had 12 siphons on each side. The relish constantly flowed into the bottles which were, according to the reporter

> being substituted by empty ones at the siphons by girls on both sides with a rapidity which looks like piano playing. The full bottles are passed on through several hands to be labelled, wrapped, packed in little trucks holding exactly a gross, and lifted to the packing floor with automatic regularity.

In another part on this floor was a room specially set apart for the employees to cook their dinners using steam heat.

Brushes with the law seem to be par for the course with manufacturing companies. Goodalls had problems with part of their trade mark. As well as trademarking the name of Yorkshire Relish, they trademarked the willow pattern. They fell into dispute with the manufacturers of Pratt's Club Relish who were also using the willow plate as part of their label. The case was brought before the Master of the Rolls in 1878. The verdict was that more than one company can use a similar motif but, usually, if there were more than three companies, permission would be refused.

Of course, having a successful product means that everyone wants to get in on the act! In 1896 Goodall, Backhouse & Co took out court proceedings against the Birmingham Vinegar Brewery Company who were marketing Holbrooks Yorkshire Relish. Birmingham Brewery maintained that because of the size of the writing of Holbrooks on the label and the distinctive colouring, they were not passing off their product as that of Goodall Backhouse. The question revolved around whether Yorksire Relish was a general name for a type of sauce or, because it had been invented by Goodall, was it the trade mark? Goodall's won and, at appeal to the House of Lords, eight learned judges unanimously confirmed that Messrs Goodall, Backhouse & Co were the acknowledged inventors of both the sauce and the title and were entitled to legal protection against infringements of the latter.

That was in June. In August of the same year Goodall Backhouse asked for a restraining order on a character named Flather who was a lodger in a small house in Chorlton-on-Medlock, Manchester. The order was to prevent him advertising or offering for sale the alleged 'secret' of making Yorkshire Relish. He had advertised this secret in No. 9 of a series headed 'Trade Secrets' which professed to reveal the constituents of patent medicines at a cost of 1/6d. Goodall Backhouse had obtained a copy, found it did not resemble their product, was calculated both to defraud the public and to injure a

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trade which it had taken forty years to build up at a cost of £40,000 in advertising and had sales of 5 to 6 million bottles per year. The restraint was granted.

One year later, in 1898, Birmingham Vinegar Brewery Company faced the High Court in Victoria, Australia, and had their trademark removed from the register in a trial that closely followed the English trial.

So how easy would it have been to copy Yorkshire Relish. What were the ingredients? We know that the reporter for the *Chemist and Druggist* on the second visit had seen large stocks of anchovies, chillies and soya. The company manufactured its own vinegar. But they also made a mushroom sauce.

Pharmaceutical Formulas of 1898 gives details by two experts involved in a similar court case of the comparative analysis of Yorkshire Relish and another Sauce. The table summarises the findings.

	Yorkshire Relish	Imitation
Specific Gravity	1.110	1.007
Acidity	3.62	3.68
Dissolved solid matter	27	15.94
Mineral matter	4.95	2.72
Nitrogen	0.13	0.16
Nitrogenous matter	0.82	1.0
Glucose	9.66	9.78
Sugar	3.8	0
Alcohol	0.8	0.1

Cream of Tartar was much more abundant in the genuine. This could have been due to added citrus fruits. The imitation was more garlicky and less aromatic. The final summary was: 'These statements show how many things have to be considered in constructing a sauce and how difficult it is to imitate.'

Rather cheekily, *Pharmaceutical Formulas* also gave a recipe for Thick York Sauce which contained garlic, cayenne pepper, mustard, salt, essence of anchovies, walnut pickle, mushroom ketchup, brandy, Indian soy and brown vinegar

From 1904 Goodalls began to advertise more of their other services in the *Chemist and Druggist* Diaries. From 1923, adverts in The Diary did not include Yorkshire Relish. Perhaps the time had come for chemists to give up selling sauces. The wholesaler Sanger's had already discontinued it in 1906. The Relish continued to be marketed, as can be seen in advertisements from 1929 and 1935. By then there was even a choice of thin or thick sauce.

I have been unable to find out any details of when Goodalls ceased to produce Relish or when they closed. The factory was in Leeds until about 1995. William Powell, who ran the company from 1870, died from pneumonia in 1900 and was succeeded by his nephew, Mr W Powell Bowman. In 1938 the company was renamed Goodalls (Leeds) Ltd.

So is that the end of Yorkshire Relish? Will we never see its likes again? Well, there is an Irish company, named Goodalls who make Yorkshire Relish! (They also make Worcestershire Sauce – but that's another story.)

This paper was presented at the BSHP Spring Conference, York, March 2011.

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History of Intranasal Delivery and the Nose

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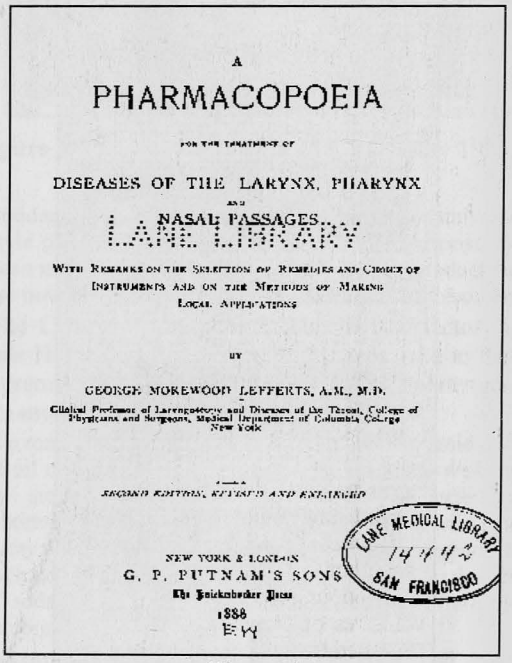
Very little has been written on the history of intranasal delivery of drugs and vaccines. In 1888 the physician George Morewood Lefferts wrote an interesting handbook or pharmacopoeia on intranasal delivery of drugs called *A Pharmacopoeia for the Treatment of Diseases of the Larynx, Pharynx and Nasal Passages*[1] (Figure 1) describing various devices, techniques, formulations and drugs that may be used and delivered into the nose. About 100 years passed until the next books on the subject were published, exploring the delivery of drugs through the nasal cavity.[2]


A

PHARMACOPOEIA

FOR THE TREATMENT OF

DISEASES OF THE LARYNX, PHARYNX

AND

NASAL PASSAGES.

WITH REMARKS ON THE SELECTION OF REMEDIES AND CHOICE OF INSTRUMENTS AND ON THE METHODS OF MAKING LOCAL APPLICATIONS

BY

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SECOND EDITION, REVISED AND ENLARGED

NEW YORK & LONDON

G. P. PUTNAM'S SONS

The Knickerbocker Press

1888

Figure 1.

The Nose in Early History

The first reference describing the importance of the nose was written in the Old Testament, where God himself blew life into Adam through his nostrils:[3]

> And the Lord God formed man of the dust of the ground and breathed into his nostrils the breath of life; and man became a living being (Genesis 2:7).

Since then several ancient writings have described the treatment of different diseases inside the nasal passage as well as the early knowledge on nasal physiology and pathology. The Papyrus Ebers, which is a 20-m long ancient Egyptian scroll written in hieratic Egyptian around 1550 BC, preserves records of ancient formulas and remedies for treating various nasal diseases[4] They describe examples of remedies to treat nasal inflammation that are used by pouring date juice into the nostrils, by rubbing the nose with peppermint-dates and

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to take milk of a woman who has born a son and fragrant bread and put them into the nose. In another Hindu[5] document a local application of an ointment is illustrated, that is delivered into the nostrils using various sternutatories[6] for cleansing the nasal cavity. Examples of sternutatories or errhines used at that time were pepper, mustard, orris, ginger and asafetida. This procedure was only carried out by rhinologists, especially if the patients had coryza:[7]

> The patient was to lie on his back, raise the tip of his nose with his index finger and allow his physician to drop in his nostrils warm oleaginous liquids. While this was being done he was not to become angry, nor speak, nor laugh, nor swallow the oil dripping from his nose, but spit it out.

The use of sternutatories or snuffs was also recommended for sleeplessness and clearing the head in the morning, often prescribed as douches and sprays. Oil was often used as solvent (menstruum) in these formulations. Fumigation was another method of administering drugs through the nose. This method was not only for local nasal diseases, but also for a wide range of situations such as to *clear the head.*

Talmudic medicine describes several sicknesses and their treatments, to be carried out according to their law. Among diseases of the nose was nose bleeding where following remedies were used: Clover root, the rope of an old bed, papyrus, saffron and the red part of a palm branch are all burned together to ashes. Then one makes two threads from sheep's wool, steeps them in vinegar, rolls them in the ashes and places them in the nostrils. Another remedy was described: The patient with a nosebleed should look for a watercourse which flows from east to west and stand astride over it, so that one foot is on either side. Then he should pick up some mud with foot, and twine two threads of wool, and rub them in the mud, and place them in his nostrils. Despite the mystical nature of these remedies, later descriptions presented tampons where vinegar was used as a medicinal material.[8]

Over the ages, nasal products have been used because of their comfort and enjoyment, such as *Ocimum sanctum* and *Ocimum basilicum*, distributed throughout India. These plants possess a common fragrant, camphoraceous odour, which may act as stimulant and diaphoretic. Leaves of *Ocimum sanctum* are dried and pulverised and used by the Bengali natives as snuff.[9]

Nasal procedures in the 19th century

Cleaning the nose by using a nasal douche was described as an important process in general health and still is in many health shops, although the procedures have not changed over the past 150 years. A common procedure for using a nasal douche was as follows:

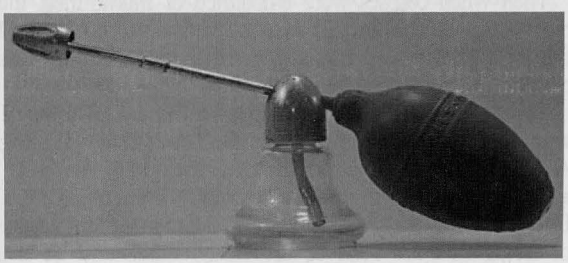

Figure 2. Nasal spray (atomiser) used in the early 20th century.

> The use of strong saline solutions in large quantity, passed through the nares under high pressure.

Occasional side-effects were a chronic inflammation of the sensitive (or delicate) nasal mucous membrane. This method was used in the 19th century, but rhinologists at that time found nasal douches not effective in cleaning the nasal cavity so they started using instruments or devices that could throw a very coarse spray in the desired direction, directly from the anterior nares. A device similar to that we recognise as a nasal spray. An example of such a device is shown in Figure 2. Then new ideas showed up and formulations were warmed up to around 37°C before administration. One such recipe is a cleansing or disinfecting solution (collunaria[10]) to be administered into the nose:

Cleansing and Disinfecting Collunaria (1888)[11]

Sodii Bicarbonatis		
Sodii Boratis	aa	ʒ ss
Listerine		ʒ i
Aquæ	ad	ʒ iv

Other nasal delivery systems published at that time were aqua medicæ; pulveres; buginaria also called nasal bougies;[12] gossypia (cotton tampons medicated with various drugs); fumi (fuming inhalations) and caustica (used eg to burn adenoids). An example of an interesting formulation described in the *Pharmacopoeia* from 1888 is an inhalant for inducing sedation: "*Acidi Hydrocyanici ʒi ad Aquæ Destillatæ ʒi* "[Rephrased: hydrocyanic acid 3.70 mL made up to 29.6 mL of distilled water], a product which really needs a careful hand.

Nasal delivery of vaccines

Although Edward Jenner's work with cowpox vaccinations holds the title to the first scientific work on combating infectious disease, the Chinese had allegedly treated smallpox with nasal inoculation as early as the 6th century. The first records describing vaccinations via the nasal route were described by a Buddhist nun in the 11th century. She selected scabs from patients that had about 1-month-old pustules. These scabs were dried and ground together with a shrub. Then, using a silver curved tube this mixture was blown into the nostrils of healthy persons.[13] However, if the weather had been hot she waited 15-20 days before using the pustules. Another early Chinese medical text described four forms of nasal inoculation against smallpox as follows:

> (1) the nose is plugged with powdered scabs laid on cotton wool; (2) the powdered scabs is blown into the nose; (3) the undergarments of an infected child put on a healthy child for several days; and (4) a piece of cotton smeared with the contents of a vesicle and stuffed into the nose.

In the early 20th century scientists tried to develop nasally administered vaccines for various pathogens. A group of scientists at the Institut Pasteur in France experimented with revaccination of humans against diphtheria and tetanus in 1927, by nasal instillation of the toxoids.[14,15] Similar experiments were carried out in Denmark 10 years later,[16] but in both studies the work was terminated due to side-effects. Other methods were also used, such as applying cotton pledgets containing diphtheria

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toxoids into the nose[17] or through inhalation of aerosolised toxin.[18] Unfortunately, some of these methods induced allergic reactions. Today, nasally administered vaccines have become popular and may be regarded as one of the best methods to achieve a mucosal immune response.

A Peek into Nasal History

The importance of the nose, its form and characteristics, has been important to man. Since creation mankind has tried to understand the various functions of our human body. The Hebrews had found out that there were 903 possible ways of dying and the Parsees invented 99,999 diseases which were to plague mankind.[19] In Papyrus Ebers, one of the first medical texts, we find the following description:[20]

> There are four vessels in both nostrils of which two carry blood and two carry mucus.

The physiology interested many of our ancient writers and they described their observations. Aristotle said that squeezing of the nose could produce nose bleeding, but it only occurred in human beings[21] and not in animals. When scientists tried to describe what happened to inhaled air, their conclusion was that it goes to the heart and to the rectum. Furthermore they said that the blood flow to the nose was closely linked to menstruation in women where it was a good sign if epistaxis occurred in a woman whose menstruation had stopped.[22]

People had discovered that sneezing could be stimulated by looking into the sun. However, their way of explaining this mechanism was that the rays of the sun should fall on the mucous membrane of the nostrils to induce the sneeze.[23] Further, in an attempt to understand the function of the nose and breathing, Aristotle commented on a hypothesis made by Alcmaeon of Croton, a Greek medical writer and philosopher-scientist (around 500 BC), who supposed that goats breathed through their ears.[24] He had probably based his description on an Egyptian papyrus dating back 1400 BC, which said:

> There belong two vessels to his left ear through which the breath of life goes; there belong two vessels to his right ear through which the breath does.

Shortly after, Empedocles, a Greek philosopher from Sicily, described it as follows:[25]

> Thus they breathe out and in. Bloodless tubes extend through all the flesh throughout the whole body, and the end of these placed within the nostrils is perforated by large openings leading to the cavities (cerebral?) so that they may hold back the blood and open free passage for the air through the meatus.

When these pioneers of medicine were dissecting the human body and trying to understand each part, various ideas arose, such as how the humidity was distilled in the gland-like contents of the cerebral cavities and sifted through the cribiform plate. They supposed that air and vapour were inspired through the cribiform plate by the brain, acting like a live sponge, drawing up into itself not only the moisture but the air of the nasal cavities and then redistilling them.[26] Hippocrates, the father of modern medicine, accepted this theory but added some important knowledge to this area by describing the following:[27]

> olfaction takes places through the cribiform plate, which is made of cartilage, soft like a sponge, and is neither flesh nor bone and placed with good reason between the eyes.

Aristotle, however, said that the passages of smell ran to the heart.[28] He also supposed that the vaporous parts of the inspired air escaped through the sutures of the skull. It is amazing how well both Aristotle and Hippocrates understood the nasal function, passage and olfaction. However, both of them had much interest in the sneeze, which they described as an outward rush of collected breath.[29,30] They said one generally sneezes twice and not once or many times because there are two nostrils. A sneeze between midnight and midday was regarded as bad but between midday and midnight as good.[31] According to the Jewish literature a sneeze could be activated in animals by making an oil from a henna plant, saturating a piece of wool with this oil and placing it on the nose of a ewe to make it sneeze. A small particle of henna wood, inserted into the nose of a ewe would have the same effect. In Talmudic writings the sneeze was used to get rid of worms in the ewe's head.[32]

Having good nasal health and conducting nasal cleaning became an important act. According to Talmudic medicine, only the soul and not the body could benefit from aroma,[33] since aroma could revive a person that had fainted. They described six organs that serve man: three are within his power and three are not. Eye, ear and nose are not dependent on his will: he sees, hears and smells even that which he does not wish to.

The nose is the identification point on the face. It determines facial expression and can give visible and valuable information about patient's health. The following description was found in the Greek sage:[34]

> When it [the nose] becomes pale, dry, and shining, and is turned to one side; the nostrils extended, dry, and dirty, and the passage of the air produces a noise; or when the point of the nose retracts and is flattened with weakness and depression, the person will soon die.

Similarly we read in Genesis 49:18 that when Jacob began to bless his sons[35] he began to sneeze, and in anticipation of his imminent death he asked God for enough time to bless his sons. Therefore, when a person sneezes, he is obligated to thank God that he remains alive.[36]

The importance of the nose did not diminish after death and in certain civilisations a procedure was carried out on dying persons. Talmudic writings described how corpses were placed on sand in order to preserve them:[37]

> If one desires that a dead man's eyes should be closed, the following should be done: blow wine into his nostrils, and apply oil between his two eyelids, and squeeze together his two big toes, then the eyes will close of their own accord.

Then when corpses were embalmed or mummified, the brain was pulled out through the nose with hooks and the skull filled with palm wine and spices; thereafter the entire body was placed in saltpetre brine for seventy days.[38,39]

Several ancient writings describe the cruel customs of war and judicial penalties where the nose is cut off. King Assurnasir of Assyria used this cruel method in 900 BC,[40] a method also used to mutilate prisoners or out of revenge. Even in Israel, the prophet warned the disobedient nation of Israel that the sons of the Babylonians and all the Chaldeans would act violently and cut off the noses of the Israelites (Ezekiel 23:25).[35] The opposite is found in the

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Hindu writings where there are descriptions of various plastic operations on the nose after such amputations.[41]

Finally, operations on mutilated or disfigured noses were also conducted during the time of Hippocrates, usually caused by diseases, although violence or act of man could have been the reason. In one of his writings he wrote:[42]

> when the bones of the nose are depressed or broken they are to be reshaped or raised into their natural position by inserting the fingers on each side as far as the conformation of the nose allows… and insert the fingers alternately, making pressure along the whole course of the nose… He [physician] should do it himself; but if not a boy or woman must do it, for the hands should be soft. I never saw a nose fractured in this way which could not be adjusted by immediate forcible manipulation before consolidation set it, if one chose to treat it properly.

Etymology of the Nose

Interestingly, it seems that the word nose has the same stem in all European languages. Hvorka[43] suggested that this word is based on a phonetic principle where the nasal resonance of the *n* followed by a vowel has had an influence in preserving the stem, as well as the sibilant *s* which seems to be common in this word. Other languages, not belonging to the Aryan stock seem to have their own word for nose. Because of that, Hvorka suggested that there would be a common derivation of this word between the tongues of the three continents, Europe, Asia and America. The word *nose* in different languages is shown in Table 1, p 70.

Physiognomy of the Nose

The importance of our nose is best described in a short novel by the Russian author Nikolai V. Gogol in 1836, *The Nose*:[44]

> If I'd lost an arm or a leg it wouldn't be so bad. Even without any ears things wouldn't be very pleasant, but it wouldn't be the end of the world. A man without a nose, though, is God knows what, neither a fish nor fowl. Just something to be thrown out of the window.

All of us have an interest in the nose, such as its shape and size and beauty. Many of us play with our nose, or pick it, when we are alone or waiting for a green traffic light for example. Parents carefully study their newborn child's nose and its characteristics, but some of us need the nose to rest our glasses on. Therefore, we use the nose to describe people and give them a character. Around 1820 it was stated in a scientific work that a long and pointed nose passes for a sign of sagacity and short and blunt nose marks simplicity of mind, easy to deceive and with very little foresight. A little nose, thin and movable, denotes a natural mocker. Large noses are an indication of heaviness, for they bespeak the lymphatic nature of the complexion. Twisted noses, they say, are a sign of an obliquity of mind; but an aquiline nose, large and muscular, announces force and courage; a flattened nose an inclination to luxury.[45] In the Holy Scriptures, we find a shepherd paying a compliment to his fiancée when he compares her nose to 'the tower of Lebanon which looketh toward Damascus' (Song of Solomon 7:5).

Because the nose became the identification mark of the face, Talmudic writings used this part of our body to describe those who were not qualified to serve in the Temple. 'When it comes to their noses, a person (even a priest) is not eligible to serve if he has a leaping nose, that is, either naturally or as a result of scarring and contracture points upward or those whose nose drops or hangs.' The reason was considered to be that these abnormal shapes referred to the numerous gross disfigurements of the nose that occur secondary to leprosy.[46]

In describing people based on their nasal characteristics, we find several descriptions where the nose is the central issue. Victor Hugo describes one of his characters in his work *Les Miserables* as follows:[47]

> The human face of Javert consisted of a pug nose [snub nose], with two wide nostrils toward which two enormous sideburns climbed across his cheeks.

In the Icelandic sagas written around the year 1000, each person is carefully described, such as[48] 'Egil was large-featured, broad of forehead, with large eyebrows, a nose not long but very thick..' Similarly, Gunnar was described around 1280 as[49] 'He was handsome of feature and fair skinned. His nose was straight somewhat turned up at the end.' Even in writings from around 400 BC we find descriptions of people like Socrates who was well known for having a snub nose which contributed to his perception, including self-perception, as ugly.[50] This is interesting in the context of Aristotle who said that those having crisp hair or hair curls were usually snub-nosed.[51]

Today, noses are classified into three categories: caucasian, negroid and oriental. However, since our noses vary significantly they have received different descriptions depending on their shape and size. The *Roman* or *Aquiline* nose is convex in shape, like a hook and also known as hooknose because of its shape. The word aquiline is derived from the Latin aquilinus (eagle like). If the nasal tip is turned downwards, the *Roman* nose is called aquiline or *Jewish* nose; the *Greek* or *Straight* nose is perfectly straight with no curves or hook-like shape. Both the *Greek* and the *Roman* nose are high and protruding because of an excess in bone structures and cartilage, but carry thin skin. The *Nubian* nose has wide nostrils. It is generally a little narrow at the top, thick and broad at the middle and wide at the end. It has little bone structure or cartilage, often covered with oilier skin. The term *Nubian* comes from an ethnic group from northern Sudan. The *Hawk* nose resembles the beak of a hawk, is very convex, to the extent that it almost looks like a bow, and is very thin and sharp. The *Snub* nose, however, is quite short in length and is neither sharp, nor hook-like nor wide and is almost as short as a nose possibly can be; the *Turned-up* nose, also called the *Celestial* nose is so called because it runs continuously from the eyes towards the tip and is concave when viewed in profile; the cogitative nose starts widening from below the bridge, when viewed from the front and the nostrils stand out; the *Manga girl* nose is short and perky.

Peoples' taste for a beautiful nose differs depending on where you come from, but it has become so important in modern society that numerous clinics around the world have specialised in changing its conformation. Darwin refers to the following conversation:[52] 'I do not want to marry him, he has got no nose' which shows that a flat nose is not an object of admiration.

What does a beautiful nose look like? Articles have been published where noses of 34 attractive young North American caucasian women were analysed quantitatively![53] Reconstructing one's nose is nothing new. Ancient Huns during the age of Attila were accustomed to flatten the noses of their infants with bandages for the sake of beauty. Similarly,

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Table 1. *The word nose translated into different languages*

European languages				Africa & Asia		America	
Albanian	hundë	*Irish*	srón	*Africaans*	neus	*North America indians*	
Anglo-Saxon	nose	*Italian*	naso	*Arabic*	anf (تصيد)	*Chinook*	bekats
Basque	sudur	*Latin*	nasus	*Chinese*	pe (鼻子)	*Clallam (Washington)*	nuk'su
Bohemian	nos	*Lettic*	nasis	*Congolese (Africa)*	djolo	*Cree*	miskiwan
Bulgarian	nosû (нюх)	*Lithaunaian*	nosis	*Hebrew*	af, nohar (אף)	*Lenape (Delaware)*	wikiwan
Cornish	frygow	*Manx*	stroinney	*Indian (old)*	nâsâ	*Mohawk*	o'nhonhsa
Croatian	nos	*Norwegian*	nese	*Indonesian*	hidung	*Onondaga*	onionchia
Czech	nos	*Norwegian (old)*	nös	*Japanese*	hana (鼻)	*South America indians*	
Danish	næse	*Polish*	nos	*Kongo*	nzunu	*Aymara*	nasa
Dutch	neus, neeus	*Portuguese*	nariz	*Korean*	(코)	*Incas (Quichua)*	seneca
English	nose	*Prussian (old)*	nozy	*Malay*	hidung	*Moxas*	nusiri
Esperanto	nazo	*Rumanian*	nas	*Maori*	ihu	*Cebuano*	ilong
Estonian	nina	*Russian*	nos (нос)	*Persian (old)*	nâna	*Chamorro*	gui'eng
Faroese	nøs	*Sanskrit*	năs	*Ruanda*	ugutwi	*Ecuadorian*	sinca
Finnish	nenä	*Scottish*	sròn	*Samoan*	isu	*Hawaian*	hundë
French	nez	*Serbo-Croatian*	nos	*Swahili*	pua	*Inuktitut*	qingaq
German	Nase	*Slovenic (old)*	nosz	*Swazi*	li-khala	*Maya*	ni'
German (old)	Nasa	*Slovenic*	nos	*Thai*	จมูก	*Mexican (Nahaute)*	yacatl
Gothic	nasa	*Spanish*	nariz	*Turkish*	burun	*Yucatec*	ni'
Greek	mi'ti (μύτη)	*Swedish*	näsan	*Ukranian*	бути		
Hungarian	orr	*Welsh*	trwyno	*Vietnamese*	ngay		
Icelandic	nef	*Yiddish*	nos				

for the Tahitians to be called long-nosed is an insult and they compress the noses and foreheads of their children.[53] So it is with the Malays of Sumatra and the natives of Brazil. The outer structure is not the only difference between human races. Differences may also be found in their nasal cavities, examples are the native American, who have a noticeably larger nasal cavity than Europeans, which may be connected with their remarkably acute power of smell.[53]

Leonardo da Vinci was probably the first one to study the detailed proportions in the face: the size of the mouth equals the distance between the parting of the lips and the edge of the chin, whereas the distance from chin to nostrils, from nostrils to eyebrows, and from eyebrows to hairline are all equal, and the height of the ear equals the length of the nose.[54,55]. A few centuries later the father of modern rhinoplasty, Jacques Joseph, presented what he considered to be the ideal nasal shape with a combined length of the three parts of the nose: the bony part, the septal cartilaginous part, and the cartilaginous and soft tissue tip. These parts should be equal to the length between the base of the nose and the edge of the chin.

Pharmacopoeias and Nasal Products

The first written information about remedies and how to make drugs are found in Ebers Papyrus (dated approximately 1580 BC) and in Leviticus (Holy Scriptures) dated around 1440-1445 BC. A number of medical writings are available with medical receipts but the first published pharmacopoeia is a collection of medical remedies by a student named Valerius Cordus in Nuremberg, in 1542. The term pharmacopoeia was used in a work published in Basel, 1561, and the first *London Pharmacopoeia* was issued in 1618. In 1888 Leffert wrote a special pharmacopoeia for drugs used to treat diseases in the larynx, pharynx and nasal passages describing various devices, techniques, formulations and drugs that may be used and delivered into the nose. Most of the older pharmacopoeias use weights and measures based on following units:

Table 2. Apothecary units.

C (gallon) = 3.785 L
O (pint) = 473 mL
lb (pound) = 373 g and
fpt (fluid pound) = 473 mL
℥ (ounce) = 29.6 mL or 31.1 g
ʒ (dram/drachm) = 3.70 mL or 3.89 g
℈ (scruple) = 1.23 mL or 1.296 g
♏ (minim) = 0.062 mL
gr (grain) = 64.799 mg
gtt (guttae) = drops
aa = of each

Roman numerals were used instead of Arabic numbers, except for the one-half where semisse, ss (or ß) was used. An example of such a formulation is

Sodii Chloridii gr. v c Sodii Borati gr. ss

which we read as: sodium chloride 5 grains (324 mg) with sodium borate ½ grain (32.4 mg).

Nasal preparations

A few of the products described in early pharmacopoeias are shown below.

Pigmenta (Paints)

Pigmenta were used and applied into the nasal passage with a camel's hair pencil or brush such as:

℞		
	Acidi Carbolici	gr. ii
	Iodi	gr. ii
	Atropinæ	gr. ss
	Petrolati ad	℥ i
	Label: *In chronic rhinitis*	

***Collunaria* (Nasal wash)**

Collunaria are solutions for general cleansing purposes used as spray or washes in the nasal passages. These could either be administered to the anterior or posterior by the mean of a nasal syringe. When administered posteriorly, the temperature had to be kept around 30-37°C.

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℞ Sodii Bicarbonatis
Sodii Boratis aa ʒ ss (1.95 g)
Listerine[56] ℥ i (29.5 mL)
Aquæ ad ℥ iv (118 mL)
Label: *Used with the nasal spray apparatus*

℞ Liquoris Potassi Permanganatis ʒ iss
Sodii Boratis ʒ i
Aquæ ad O i

***Aqua Medicatæ* (Medicated water)**

Aqua medicatæ were remedies made for the treatment of simple chronic rhinitis and hypertrophic rhinitis:

℞ Zinci Iodidi gr. v ad aquæ ℥ i
℞ Acidi Tannici gr. v-xx ad aquæ ℥ i

In severe cases of rhinitis the following should be used:

℞ Iodi gr. iv
Potassii Iodidi gr. x
Zinci Iodidi ϑ i
Zinci Sulphocarbolatis ϑ i
Listerine ℥ i
Aquae ad ℥ iv

To the last formulation: add enough very hot water to half fill a hand-ball atomiser. Passing through the tube will sufficiently modify the heat, and render the application of this preparation to the irritated mucous surface, a most soothing and grateful expedient.

Other drugs suggested to treat rhinitis are: sanguinaria, galangal, carbolic acid, creosote, salicylic acid, iodine, potassium bromide etc.

***Pulveres* (Powders)**

Examples of pulveres to be used intranasally:

℞ Pulveris Foliæ Belladonnæ gr. xx
Pulveris Morphinæ Sulphatis gr. ii
Pulveris Acaciæ ad ℥ ss
Label: *For acute coryza*

℞ Pulveris Camphoræ ʒ ii
Acidi Tannici ʒ ss
Pulveris Sacchari Lactis ad ℥ ss
Label: *For acute coryza in infants*

***Buginaria* (Nasal bougie)**

Buginaria is a delivery form made of medicated gelatin and is a little over three inches [75mm] in length, slightly conical and about one quarter of an inch [6.5mm] in diameter at the thick end and tapering almost to a point. They are easily placed into the nasal passage and they adapt easily to the irregular nasal cavities. After administration the nostril is loosely plugged with cotton in order to prevent leaking when the gelatin is liquefied. The bougie will melt in 20-60 minutes depending on the secretion present.

To treat simple chronic nasal catarrh:

℞ Acidi Tannici gr. i
℞ Zinci Sulphatis gr. i

To treat hypertrophic nasal catarrh:

℞ Iodoformi gr. ii
℞ Iodoformi gr. ii
Belladonnæ Ext. gr. ¼

To treat atrophic nasal catarrh:

℞ Acidi Carbolici gr.ss
℞ Belladonnæ Ext. Alc. gr. ¼

and the formulations to treat hypertrophic and atrophic nasal catarrh were also used to treat fetid nasal catarrh, syphilitic and strumous ozaena as well as:

℞ Acidi Salicylici gr. i
℞ Zinci Salicylatis gr. i

Gossypia

These are medicated cotton tampons used to treat diseases of the nasal passages.

℞ Styptic Cotton (Perchloride of Iron)
℞ Tannated Cotton

Nebulae

Nebulae were medicated fluids to be atomised and inhaled through the nasal passage:

To be used as astringents:

℞ Nebulae Aluminis gr. viii ad Aquae Destillatae ℥ i
℞ Nebulae Ferri et Ammonii Sulphatis gr. iii ad Aquae Destillatae ℥ i

To be used as antiseptics and stimulants:

℞ Nebulae Acidi Carbonici gr. iii ad Aquæ Destillatæ ℥ i
℞ Nebulae Potassii Permanganatis gr. v ad Aquae Destillatae ℥ i

To be used as sedatives:

℞ Nebulae Hydrocyanici Diluti ʒ i ad Aquae Destillatae ℥ i
℞ Nebulae Aquae Lauro-cerasi (B.F.) q.s. ad Aquæ Destillatae ℥ i
℞ Nebulae Potassii Bromidi gr. xx ad Aquae Destillatae ℥ i

To be used as resolvent and antiseptic:

℞ Nebulæ Acidi Lactici ℳ xxx ad Aquae Destillatae ℥ i
℞ Nebulæ Sodii Salicylatis gr. xx ad Aquae Destillatae ℥ i

To be used as antiseptic and detergent:

℞ Nebulae Iodoformi gr. xl ad Aetheris Fortioris ℥ i

Caustica

Caustica were used to treat diseases in the nasal cavity such as to destroy redundant tissues such as the adenoids, hypertrophic rhinitis as well as other diseases.

℞ Argenti Nitras Fusus
℞ Acidum Chromicum
℞ Pasta Londinensis

Variae

Variae are Smelling Salts

℞ (*No.1*)
Acidi Carbolici ʒ i
Carbonis Ligni ℥ ss
Iodi ʒ i

Mix the carbolic acid with one half of the charcoal and mix the iodine with the other. Then mix together thoroughly.

(*No. 2*) Ammonii Carbonatis ℥ i
Carbonis Ligni ℥ ss
Camphorae ℥ i

Add Nos 1 and No. 2 together lightly, then add Olei Lavandulae, gtt. xx, and sufficient quantity of Tincturae Benzoini Compositae to make a thick paste. Recommended for acute coryza.

Snuff for chronic coryza

℞ Hydrastis Canadensis gr. v
Indigo gr. ss
Pulveris Camphoræ gr. ii
Acidi Carbolici gr. ii
Sodii Chloridi ʒ i

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6. Sternutatories and errhines are drugs which cause sneezing and increased secretion from the nose when locally applied to it. These drugs must be administered in a pulverised form. Examples are: tobacco (snuff), ipecacuanha, euphorbium and saponin.

7. Coryza describes inflammation of the mucous membranes lining the nasal cavity with symptoms like nasal congestion and loss of smell, among other symptoms of eg common cold.

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10. Collunaria is a solution for nasal application.

11. See Table 2 for the description of these apothecaries units.

12. Buginaria are medicated pencils for the application of drugs to the nostrils.

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56. Listerine at that time was a formula introduced by Lambert & Co., of St. Louis, containing the essential antiseptic constituents of thyme, eucalyptus, baptisia, gaultheria, and mentha arvensis in combination. Each drachm contained two grains of refined and purified benzo-boracic acid.

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40th International Congress for the History of Pharmacy

Berlin-Brandenburg Academy of Sciences and Humanities, Gendarmenmarkt, BERLIN

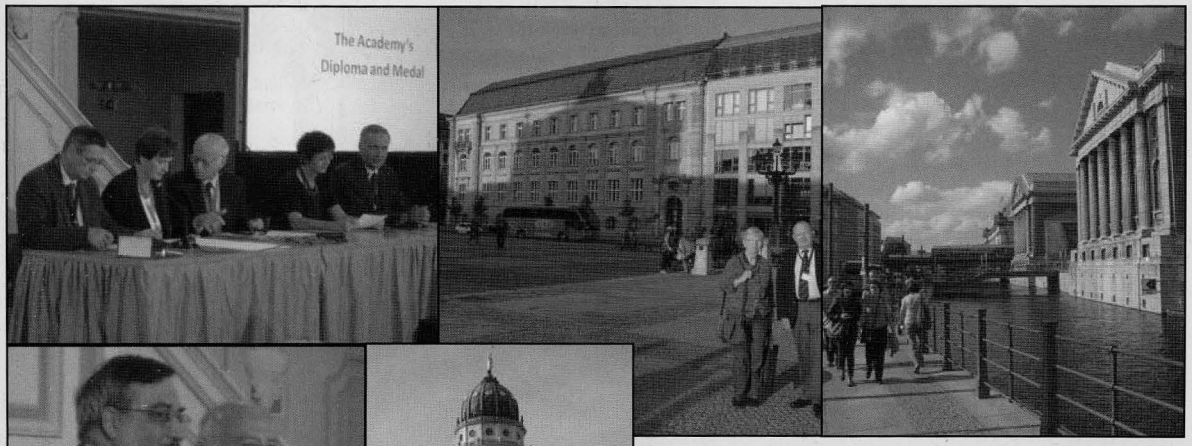
14-17 September 2011 **'Pharmacy and Books'**

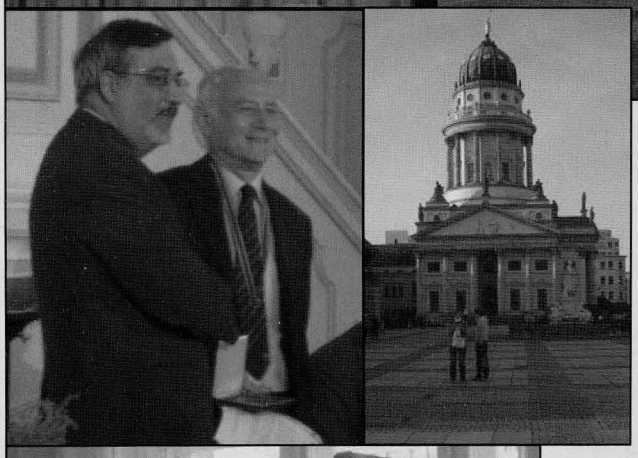
Over 300 attended the Congress, including about 12 members of BSHP, though the majority were from the host nation Germany. Sessions were held in the heart of what had been East Berlin in the Gendarmenmarkt. There were over 90 short papers, 54 posters and 7 plenary lectures in the well-appointed premises of the Berlin-Brandenburg Academy of Sciences and Humanities. All aound the area were evidences of the Soviet occupation, the Berlin Wall and the rebuilding and renovation that followed its destruction. Short papers or joint posters were presented by BSHP members Stuart Anderson, Axel Helmstädter, Peter Homan, Christiane Staiger, Halil Tekiner and Ainley Wade.

Social events included an evening boat trip on the River Spree, a Banquet in the Kaisersaal at the Potsdamer Platz and a day trip to the Palaces at Potsdam.

Dr Stuart Anderson presided over the Ceremonial Meeting of theInternational Academy for the the History of Pharmacy at the French Dom and it was followed by a Reception given by the Federal Union of German Associations of Pharmacy in the nearby Deutsche Apothekerhaus.

The next Congress, to be held in Paris, 11-14 September 2013 will celebrate Parmentier's bicentenary and the centenary of the first society for the history of pharmacy in France.





40th International Congress for the History of Pharmacy.

Above, from left: International Academy officers; the Berlin-Brandenburg Academy; Museums on the Berlin Museum Island. *Centre,* from left: Prof. Greg Higby, Director, AIHP, USA presenting the George Urdang Medal of AIHP to Dr Stuart Anderson; the French Friedrichstadt Church at Gendarmenmarkt;. *Below,* Discussing posters at the poster sessions.

Photos: A and D Wade; Peter Homan

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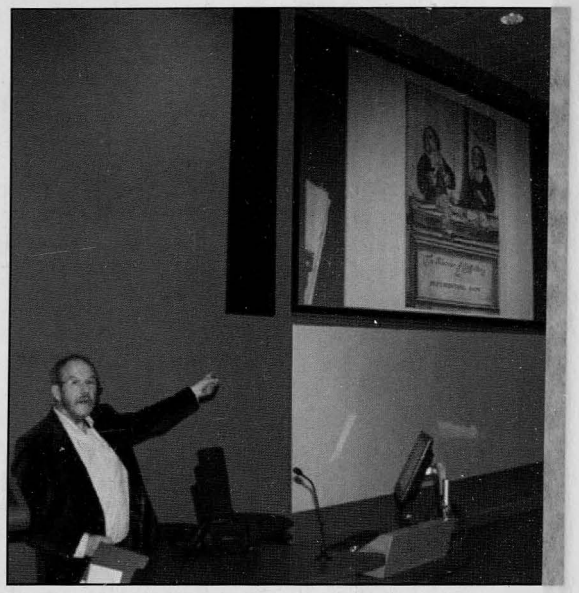
UEA School of Pharmacy annual awards ceremony, co-hosted by the British Society for the History of Pharmacy.

The School of Pharmacy celebrated student excellence with over 100 students and guests from the East Anglia pharmacy community attending the ceremony held at the Thomas Paine Study Centre, University of East Anglia on the 2nd November 2011. Guests were welcomed by Trevor Whaley, President of the British Society for the History of Pharmacy. Trevor introduced the audience to the work of the British Society for the History of Pharmacy and the annual £500 bursary for the student who submits the best piece of original work on a topic related to the history of British pharmacy.

Pip Wright, author and historian presented an entertaining and illuminating history of the plague in 17th century Suffolk. His exuberant storytelling brought to life the sounds and smells of this period.



Pip Wright

Following the entertaining account of the plague in Suffolk, Professor Mark Searcey, head of the School of Pharmacy, introduced the presentation of awards to high achieving students (below). The prizes included excellence in science and pharmacy practice and were sponsored by leading companies within the pharmaceutical industry and community pharmacy.

Dr Debi Bhattacharya, UAE

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